



INSTITUTE FOR DEFENSE ANALYSES

Independent Review of the Defense Logistics Agency's Roles and Missions

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Executive Summary

The Institute for Defense Analyses (IDA) undertook this independent review in response to congressional concerns regarding the roles, missions, and performance of the Defense Logistics Agency (DLA). At the request of Congress, this review identifies those “functions, roles, missions, activities, or initiatives that could be more effectively performed by the military departments or other defense agencies” as well as those “that could be more efficiently performed by DLA that are currently being performed by other military departments or defense agencies.” The review also provides additional recommendations on critical issues such as “support to customers, management practices, demand forecasting...and inventory management.”¹

Overall Findings

DLA is successful on two levels. First, its experiences and performance validate Office of the Secretary of Defense (OSD) policy decisions regarding the benefits of consolidating common processes to achieve efficiencies, while maintaining effective support to the warfighter. The supply, storage, and distribution portions of the supply chain are characterized by high fixed costs and low marginal costs. The Department of Defense (DOD) efforts to combine these common business practices within a defense-wide agency are based on these economies of scale; it has been a successful strategy. Continual review of DLA’s performance enables DOD to identify and exploit opportunities for further improvement.

Second, DLA manages its business effectively and efficiently through four essential core competencies: demand planning, inventory management, procurement, and storage and distribution. This management capability is built on top of an effective Information Technology (IT)/Enterprise Resource Planning (ERP) system. DLA faces strong incentives to reduce costs, and it employs an effective governance structure. DLA also shows, both with its successes and with its continuing challenges, the importance of building and maintaining customer focus and meeting the requirements of the customers.

¹ U.S. House of Representatives, *National Defense Authorization Act for Fiscal Year 2014, Report of the Committee on Armed Services, House of Representatives on H.R. 1960* (Report 113-102) (Washington, DC: U.S. Government Printing Office, June 7, 2013), 116–117.

As with any organization, DLA faces challenges and there is room for improvement. The challenges remaining in DLA's adaptation to its new retail responsibilities are of particular importance. However, the analysis and resulting recommendations for improvement detailed in this paper should be understood in the context of an organization that is working well.

Consolidation and New Boundaries

Economies of scale have allowed DOD to move common missions from the Military Services to DLA to consolidate activities, eliminate redundant fixed costs, and achieve better DOD-wide enterprise optimization. This long-term DOD strategy of consolidation was reflected in the 2005 Base Realignment and Closure (BRAC) process. In one action, the remaining wholesale consumables missions of tires, packaged petroleum, oils, and lubricants, and gases and cylinders were transferred from the Services to DLA. These are, for the most part, high-volume, commercially available commodities; their transfer was consistent with previous transfers of missions to DLA.

BRAC 2005 also did something different, by moving the boundary of DLA's responsibilities into a new and critically important area: retail support to Service industrial maintenance activities (depots and shipyards). In addition, BRAC 2005 realigned certain procurement management and related support functions for depot level repairables (DLRs) from the Services to DLA. Previous consolidations had all involved the transfer of wholesale functions, that is, the supply, storage, and distribution of goods in large quantities to be re-sold or provided in smaller quantities—to be retailed—by the Military Services themselves to their final consumers (e.g., the artisan or mechanic on the production line). The transfer of these retail responsibilities to DLA was expected to improve supply chain efficiency and integration, and reduce or eliminate unnecessary seams in the logistics system. DLA's core capabilities of demand planning, inventory management, contracting, and storage and distribution provided the foundation which gave the DOD leadership confidence that this new consolidation would be successful.

A central finding of this review is that DLA has made substantial progress in meeting its new responsibilities for retail logistics, with the result of enhancing supply chain efficiency and operational readiness. At the same time, it still has important challenges to overcome in how it provides retail support.

A second important shift in a boundary defining DLA's responsibilities occurred in support of combat operations in Iraq and Afghanistan. In both conflict areas, DLA was called upon to support deployed troops by not only shipping sustainment supplies from the United States to the theater of operations but also by consolidating supplies as they arrived in the theater and then sending them forward to customers in the field. The Military Services, as revealed in interviews with senior military officials, were very complimentary

of the support their forces received as a result of this extension of DLA's activities beyond its traditional boundaries, particularly in operations in mature theaters. However, work remains to be done to ensure that the valuable lessons learned in these conflicts are incorporated into doctrine, training, and exercises.

The Scope of This Independent Review

Although challenges exist in all aspects of DLA's business, some of the biggest challenges and the most attention are focused on DLA's ability to deliver Class IX repair parts to its operational and industrial customers (military depots and shipyards). This is in addition to the importance of keeping deployed forces fully supplied in contingency operations (such as occurred in Afghanistan and Iraq). Although repair parts represent \$7.2 billion (36 percent) of DLA's \$19.8 billion in non-energy revenues, they are an essential component of an industrial and operational logistics and maintenance system that expends tens of billions of dollars a year to maintain operationally ready forces. Furthermore, the BRAC 2005 decision to transfer retail missions to DLA resulted in new challenges and opportunities, some of which DLA is still working to resolve and institutionalize.

Because the congressional interest is centered on "functions, roles, missions, activities, or initiatives that could be more effectively performed by the military departments or other defense agencies...[or] by DLA,"² this review does not evaluate in depth DLA's performance in traditional areas that are widely accepted as DLA's core functions and competencies. These areas include food, medicine, fuel and other high volume, commercially available commodities, none of which represents areas of major concern among DLA, Service, or other DOD officials contacted in the course of this research. Consequently, the primary focus of this study is on the provision of Class IX repair parts to DLA's military customers.

Major Findings

The results of this review fall under the following three major findings.

1. DLA possesses the skills and capabilities required to perform its core functions.

- DLA has the demonstrated ability to perform the core functions of (1) demand planning, (2) inventory management, (3) contracting, and (4) storage and distribution.
- The DLA governance structure provides decision-makers with the information they need in order to oversee and manage the work of the organization.

² Ibid.

- DLA's IT/ERP infrastructure, the Enterprise Business System, provides an essential backbone upon which the entire business can be managed.
2. **DLA has made significant progress in improving its customer focus during the last several years. Efforts to improve retail support to military industrial customers are particularly noteworthy.**
- The authorities of DLA's buying command and on-site commanders (at military industrial maintenance facilities) have been expanded.
 - There is more extensive integration of the DLA buying commands with their industrial customers' production planners.
 - The DLA Aviation Command is pioneering the use of new kinds of Air Force retail metrics.
 - Significant progress has been made in the integration of wholesale and retail storage and distribution.
 - Improved inventory management techniques and demand planning collaboration exist and undergo continuous improvement.
 - The Time-to-Award Reengineering Program is addressing key performance issues in the critical functional area of contracting.
 - Standard wholesale metrics show improving performance trends.
 - The support provided to deployed forces, particularly in Afghanistan and Iraq, has been highly praised by the leadership in the Services and the combatant commands.
3. **DLA's retail customer focus needs further improvement.**
- BRAC 2005 added a new function, retail responsibility for industrial customers, which DLA is still absorbing and refining.
 - The successes in retail support are accompanied by significant workarounds at the Services and DLA.
 - Several management and process changes are not yet fully institutionalized.
 - DLA's traditional wholesale orientation (culture) is slowing the adoption of more effective retail processes and more focused customer support.

Recommendations

DLA's increased emphasis on providing a customer focus is yielding positive results. However, there are still a number of areas in which improvements can be made by DLA—

and by its customers in the Services. This paper contains recommendations for improvement in seven areas:

- **Supply chain integration.** DLA should accelerate its integration into customer production planning processes.
- **Measuring DLA's responsiveness to its customers.** DLA should adopt additional metrics to better support its retail customers.
- **Demand planning.** The Services should work with DLA to improve their joint demand forecasting.
- **Time to award.** DLA's reengineering effort should continue to receive a high priority; DLA and the Services both need to make continued improvements to management processes.
- **DLRs.** DLA and the Services should conduct a business case analysis to assess whether to transfer contracting for the repair of reparable from the Services to DLA.
- **Operational integration.** The Services, the combatant commands, and OSD need to institutionalize the lessons learned from recent contingency operations, especially with respect to planning.
- **Energy.** DOD should expand DLA's authority to contract directly for the maintenance and repair of fuel infrastructure.

Congressional Questions

This research concludes that DLA's organization and core capabilities provide it with the ability to perform its roles and missions effectively. This research does not identify any responsibilities that DLA should devolve back to the Services.

The Services do have two sets of responsibilities that might eventually be transferred to DLA. The first is the retail supply missions at the Army and Marine Corps industrial depots. The second is contracting for the repair of DLRs. In both cases, OSD, the Services, and DLA should conduct a detailed business case analysis before any action is taken.

This paper responds to the Congressional request by providing findings and specific recommendations for enhancing several business processes within both DLA and the Services in order to improve support to DLA's customers. The paper addresses all these issues in detail, and the final chapter is devoted to responding directly to each of the six topics posed by the Congressional request.

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1. Introduction

A. The Origins and Purpose of This Independent Review

This review assesses the alignment of roles and missions, and evaluates the organization and management capabilities, of the Defense Logistics Agency (DLA).

At the request of Congress, this review provides the following:

- an examination of the roles and missions currently assigned to DLA;
- an assessment of DLA's ability (e.g., resources, management structure, workforce) to adequately accomplish those roles and missions;
- the identification of DLA functions, roles, missions, activities, or initiatives that could be more efficiently performed by the military departments or other defense agencies;
- a transition plan for any activities recommended for migration;
- an assessment of functions, roles, missions, activities, or initiatives that could be more efficiently performed by DLA that are currently performed by other military departments or defense agencies; and
- other recommendations on ways DLA could further improve its support to customers, management practices, demand forecasting, use of modeling to optimize solutions, and inventory management.³

The Acting Assistant Secretary of Defense for Logistics and Materiel Readiness (ASD(L&MR))⁴ asked the Institute for Defense Analyses (IDA) to review and assess the functions and responsibilities associated with DLA, including its responsibilities for supplying fuel and energy. The Director of DLA, DLA senior managers, and senior officers and officials in the Military Services and the Joint Staff provided strong support for every aspect of this effort.

³ U.S. House of Representatives, *National Defense Authorization Act for Fiscal Year 2014, Report of the Committee on Armed Services, House of Representatives on H.R. 1960* (Report 113-102) (Washington, DC: U.S. Government Printing Office, June 7, 2013), 116–117. The full text is provided in Appendix B of this IDA paper.

⁴ ASD(L&MR) is in the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD(AT&L)).

B. Research Approach

The primary source of information for this research was interviews and discussions conducted by IDA with more than 200 officials in DLA, the Office of the Secretary of Defense (OSD), the Joint Staff, and with DLA's customers (the Military Services). See Appendix A for a partial list of interviewees. Appendix B contains the relevant pages on this topic from the *National Defense Authorization Act for Fiscal Year 2014*.⁵

Previous reports from the Department of Defense (DOD), the Government Accountability Office (GAO), the RAND Corporation, Business Executives for National Security, and other organizations were also reviewed, as were briefings and point papers provided by OSD, DLA, and other sources. These covered a wide range of topics. See Appendix D.

It became clear to the study team early in the research that quantitative metrics alone, although useful in painting a broad picture of DLA and its customers, were inadequate to the task of understanding DLA's organizational and management capabilities and challenges. Consequently, it was necessary to combine previous reports, briefings, and other written materials with metrics and, most importantly, with interviews and discussions with DLA, its customers, and other experts.

Interviews and discussions were conducted as open-ended conversations, not as a formal checklist of topics with the expectation of simple or straightforward answers. DLA interviewees were asked the following questions:

- What do you, your office, and your organization do; i.e., what are your functions, deliverables, and capabilities?
- How are you organized to perform your responsibilities?
- What are your interactions with other parts of the DLA organization, and how are responsibilities and authorities understood and shared?
- Who are your customers and what are the different ways in which you interact with your customers?
- What metrics and other information do you use to manage your business and to know whether your customers' requirements are being met?
- What capabilities do you and the larger DLA enterprise possess so as to provide the necessary functions and deliverables to meet your customers' requirements?

⁵ U.S. House of Representatives, *National Defense Authorization Act for Fiscal Year 2014*, 116–117.

- What additional capabilities or changes to current capabilities, processes, or functions would enhance your ability to perform your job, or DLA's ability to deliver better service to its customers?

Separately, Service interviewees and discussants were asked, what do you need from DLA and how well does it provide those goods and services? The questions were designed to solicit the Military Services' perspectives on DLA's strengths and weaknesses, including how well DLA interacts with and understands its customers. Interviewees were also questioned about Service responsibilities for being a "good customer"—i.e., performing their role in providing the necessary information to DLA and in integrating their efforts with those of DLA.

OSD and Joint Staff officials and outside experts, including former military and DLA officials, also provided their perspectives on these questions and issues.

The next chapter, Chapter 2, provides an overview of DLA, with a brief look at its responsibilities, functions, organization, governance structure, and some commonly used metrics of performance. Chapter 3 presents the major research findings, and Chapter 4 provides more detailed findings and numerous recommendations. Chapter 5 maps the findings and recommendations in the paper to each of the questions posed by the Congress. Appendices C and E are the lists of illustrations and abbreviations, respectively.

C. Research Focus

Although challenges exist in all aspects of DLA's business, some of the biggest challenges and those attracting the most attention are focused on DLA's ability to deliver repair parts to its operational and industrial (military depots and shipyards) customers. This is in addition to the importance of keeping U.S. deployed forces supplied, such as in Afghanistan and Iraq during recent operations. Although repair parts comprise \$7.2 billion (36 percent) of DLA's \$19.8 billion in non-energy revenues, and sales to military industrial facilities are about \$2 billion, they are an essential component of a supply chain in which the Military Service depots, shipyards, and other industrial facilities spend tens of billions of dollars per year on maintenance and keeping the operating forces supplied with operationally ready systems. Furthermore, the 2005 Base Realignment and Closure (BRAC) decision to transfer retail missions to DLA resulted in new challenges, some of which DLA is still working to resolve and institutionalize.

Because the congressional interest is centered on "functions, roles, missions, activities, or initiatives that could be more effectively performed by the military departments or other defense agencies...[or] by DLA,"⁶ the IDA paper does not evaluate

⁶ Ibid.

in depth DLA's performance in traditional areas that are widely accepted as DLA's core functions and competencies. These areas include food, medicine, fuel, and other high volume, commercially available commodities, none of which represent areas of major concern among DLA, the Military Services, or other DOD officials contacted in the course of this research.

Consequently, the primary focus of this study is on the provision of Class IX repair parts to DLA's military customers.

2. Overview of the Defense Logistics Agency

A. DLA's Responsibilities and Functions

DLA is a Defense Department Combat Support Agency. The DLA Director is a three-star flag or general officer who reports to the Assistant Secretary of Defense for Logistics and Materiel Readiness.

DLA had annual revenues of approximately \$38 billion in Fiscal Year (FY) 2013 (Table 1). These revenues are from the sales of goods and services to its customers. As a distributor and integrator, DLA either (1) buys items from manufacturers and suppliers which it then resells to its DOD (and other) customers, often with additional services added—e.g., warehousing, packaging, and transportation; or (2) contracts for items that are provided directly by the manufacturer to the DOD customer. This latter is known as Direct Vendor Delivery (DVD).

DLA is responsible for the supply (purchasing), storage, and distribution of most consumable and repairable items for DOD.⁷ Its primary purpose is to meet the logistics requirements of the Armed Forces for food, clothing fuel, repair parts, and other items, as seen in Table 1.⁸ Noticeably absent from this list are major end items (Class VII)—weapon

⁷ DOD Directive 5105.22, "Defense Logistics Agency," states the "Mission" of DLA as follows: "The DLA shall function as an integral element of the military logistics system of the Department of Defense to provide effective and efficient worldwide logistics support to the Military Departments and the Combatant Commands under conditions of peace and war, as well as to other DoD Components and Federal agencies, and, when authorized by law, State and local government organizations, foreign governments, and international organizations." (§ 3) Among DLA's "Responsibilities and Functions" are "...to integrate and improve the global supply chain..." (§ 5.3), "[p]rovide materiel commodities and supply chain management for items of supply and services that have been [assigned to it] (§5.4)," "[p]erform logistics services associated with furnishing materiel commodities and items of supply..." (§ 5.5), and "[m]aintain a DoD worldwide distribution system..." (§ 5.7). (Department of Defense, "Defense Logistics Agency (DLA)," DOD Directive 5105.224 (May 17, 2006); <http://www.dtic.mil/whs/directives/corres/pdf/510522p.pdf>).

⁸ Supply classes are defined in Chairman, Joint Chiefs of Staff, *Distribution Operations*, JP 4-09, 19 December 2013, http://www.dtic.mil/doctrine/new_pubs/jp4_09.pdf, accessed 12 November 2014. *Class I*: Rations and Rations and gratuitous issue of health, morale, and welfare items. *Class II*: Clothing, individual equipment, tentage, tool sets, and administrative and housekeeping supplies and equipment. *Class III*: Petroleum, oils, and lubricants. *Class IV*: Construction materials. *Class V*: Ammunition. *Class VI*: Personal demand items. *Class VII*: Major end items, including tanks, helicopters, and radios. *Class VIII*: Medical. *Class IX*: Repair parts and components for equipment maintenance. *Class X*: Nonstandard items to support nonmilitary programs such as agriculture and economic development.

systems and related equipment—which are procured by the military departments.⁹ Also absent is ammunition (Class V), which, with some exceptions, is an Army responsibility, as executive agent. DLA is also responsible for the disposition of all excess or surplus DOD materiel, including Class VII weapon systems.

Table 1. DLA FY 2013 Revenues by Supply Class (Billions of Dollars)

Class	Description	\$Billion
Class I&VI	Subsistence, Personal Items	3.4
Class II	Clothing and Textiles	1.8
Class IV	Construction and Equipment	2.3
Class VIII	Medical	5.1
Class IX	Repair Parts	7.2
Non-Energy Supply Chain		Total: 19.8
Class III	Energy	16.7
	Misc.	2.1
		Total: 18.8
		Grand Total: 38.6

Source: DLA J8 Finance.

To accomplish these responsibilities, DLA has a staff of 24,000 personnel divided into the following elements:

- several supply chains that contract for the above items,
- a worldwide distribution system,
- logistics and staff support to DOD’s geographic combatant commands,
- a “reverse logistics” operation that disposes of surplus or excess materiel from the Military Services and DLA,
- headquarters, and
- other responsibilities that have flowed to DLA over the years.

Additional responsibilities include the provision of human resources support (back office) functions for OSD and many of the defense agencies, as well as the management of the strategic materials stockpile, the provision of document services, the Defense Logistics Information Service, and the Defense Automated Addressing System.

DLA operates with a revolving Defense-Wide Working Capital Fund (DWCF). Its customers purchase items from DLA with their own appropriated funds that are deposited

⁹ The Construction and Equipment program within DLA Troop Support provides some Class VII non-weapon systems.

into the DWCF. In turn, DLA purchases items from its suppliers out of the revolving fund. The prices DLA charges to its customers for each product include an additional amount to recover DLA's operating costs, which were approximately \$4.4 billion in FY 2013. The cost recovery rate (which is actually a composite of separate rates covering all the different business areas) is determined by the OSD Comptroller every year. It is used to encourage DLA to keep its costs under control, and to ensure that its profit every year is zero; i.e., that ideally the amount of cash in the revolving fund neither increases nor decreases over time.

1. Customers

DLA has four distinct classes of customers: (1) deployed forces, (2) non-deployed forces, (3) military industrial facilities (depots and shipyards), and (4) others, including other U.S. Government agencies and foreign military sales (FMS). These distinctions are important because each class of customers has unique needs.

Deployed forces are those operating forces apportioned to a combatant commander and deployed to an active theater of operations. DLA must deliver supplies to various distribution points near or within the combat zone (as it did in Afghanistan and Iraq), where tactical distribution is generally handled by one of the Military Services.

Non-deployed operating forces are normally assigned to bases or installations in the United States and around the world. This includes everything from a base that is home to an Air Force wing or Army division, to an installation containing support functions such as hospitals or other service providers. DLA is the wholesale supplier to these operational customers (again, this includes items for which DLA contracts but which are delivered directly by the suppliers to the customers), who in turn provide their own retail services—the sale or distribution of individual items—to the final customer or user assigned to or transiting the base.

DLA's **military industrial customers** include the 17 primary maintenance depots and shipyards in the four Military Services: three Air Logistics Complexes (ALCs) in the Air Force, the three main Fleet Readiness Centers (FRCs) in the Navy and Marine Corps, four Navy shipyards, two Marine Corps depots, and five Army depots (Table 2). DLA is responsible for both wholesale and retail supply, storage, and distribution at the Air Force and Navy industrial facilities. It is responsible only for wholesale supply at the Army and Marine Corps depots. This reflects the mixed implementation of the 2005 BRAC decisions, discussed in the next chapter.

Table 2. DLA's Military Industrial Customers

Army Depots (Army Materiel Command)

- Anniston (Alabama)
- Letterkenny (Pennsylvania)
- Red River (Texas)
- Tobyhanna (Pennsylvania)
- Corpus Christi (Texas)

Navy Shipyards (Naval Sea Systems Command)

- Norfolk (Virginia)
- Pearl Harbor (Hawaii)
- Portsmouth (Maine)
- Puget Sound (Washington)

Navy Fleet Readiness Centers (Naval Air Systems Command)^a

- Cherry Point, Marine Corps Air Station (North Carolina)
- Jacksonville (Florida)
- North Island (California)

Marine Corps Logistics Base (Marine Corps Installations Command)

- Albany (Georgia)
- Barstow (California)

Air Force Air Logistics Complexes (Air Force Materiel Command)

- Hill (Utah)
 - Tinker (Oklahoma)
 - Warner Robins (Georgia)
-

^a These are the three Level III FRCs.

DLA also provides goods and services, including storage and distribution, to a wide range of **other customers**. The most notable are other U.S. Government agencies, including the Federal Emergency Management Agency, other parts of the Department of Homeland Security, and the General Services Administration. DLA also supplies FMS customers.

2. Functions

DLA's central functions are to (1) buy, (2) store if necessary, and (3) distribute¹⁰ approximately 6 million distinct consumable and reparable items.¹¹ To do this it must know how much to buy; whether and where to store it; and how to distribute it most efficiently.¹² This requires effective demand planning, inventory management, contracting, and storage and distribution capabilities, together leveraging a powerful IT/ERP¹³ backbone and an effective governance structure. It also requires tight retail-wholesale-supplier-customer integration. Working closely and in an integrated fashion with its customers—seeking effective and efficient supply chain integration—is critical to DLA's success.

DLA is responsible for the delivery of consumable and reparable items where and when they are needed by its customers. For deployed forces, therefore, the expectation is that DLA will deliver items to the distribution point required by the customer. DLA is not responsible for tactical theater distribution.¹⁴

DLA delivers wholesale and retail goods to its customers. Wholesale is the procuring of goods, usually in large quantities, to be retailed—sold or distributed—by others. Retail is the selling or providing of goods in relatively small quantities to the final user or consumer. This distinction, and particularly the importance of DLA's retail capabilities to its current and future operations, is an important theme of this paper.

¹⁰ Many high volume, commercially available consumable items, such as food and medical supplies, are contracted for by DLA but are ordered by and delivered directly to the customer. Under "Direct Vendor Delivery" (DVD), DLA does not store the items. Neither does it physically distribute (touch) the items; this is handled by the manufacturer or supplier, although these contractors employ transportation contracts made available to them by DLA.

¹¹ Consumables are items such as food, clothing, medical supplies, fuel, and repair parts. Repairables are items, similar to repair parts, that are eventually consumed, but which may be repaired some number of times before they must be discarded. Thus a bolt is a consumable, but the gear box for which that bolt is a repair part is a repairable. Consumables are purchased to repair this repairable during its lifetime, until eventually the repairable item is discarded and a new gear box—a "new repairable"—is purchased. Repairable items are repaired in military depots, or the depot may contract out for the repairs with a commercial facility. Thus, they are called "depot level repairables" (DLRs), and a newly purchased repairable item is a new DLR. The distinction between new DLRs and the repair of repairables is discussed in Chapter 4.

¹² Transportation is handled in partnership with the U.S. Transportation Command (USTRANSCOM). Within USTRANSCOM, the Surface Deployment and Distribution Command (SDDC) establishes the CONUS (continental United States) networks and contracts that DLA and its contractors employ.

¹³ IT/ERP – Information Technology and Enterprise Resource Planning.

¹⁴ There are occasional exceptions to this rule, as happened in Afghanistan and Iraq, where—according to DLA, Combatant Command, and Service officials interviewed for this study—DLA was asked to assume additional, non-traditional responsibilities to help its deployed customers meet their operational requirements.

For non-deployed forces and some military industrial facilities, the expectation is that DLA will provide on-time wholesale delivery to Service retail providers. For other military industrial customers, DLA is the retail supplier. In these cases the customers' expectations are that DLA will have the individual parts needed for the mechanics and artisans—the final users who are DLA's retail customers at the depots and shipyards.

3. Essential Capabilities

Numerous capabilities are required to successfully provide for these functions and deliverables. The most important are

- Demand Planning
- Inventory Management
- Contracting
- Storage and Distribution

a. Demand Planning

Demand planning is the process by which DLA, in collaboration with its customers, forecasts demands for the products it supplies. The more accurate the demand planning, the more effectively and efficiently DLA is able to meet its customers' requirements. Inaccurate demand planning can cause inventories to be maintained at higher levels than needed (excess inventory), or it can lead to shortages of needed items (backorders).

DLA employs two complementary processes for conducting demand planning. First, it maintains extensive data on historical demands for all items in the Enterprise Business System (EBS), which is DLA's enterprise resource planning (ERP) system. This enables DLA to forecast demand accurately for many items on the basis of past demand patterns.

The second process consists of various forms of collaborative demand planning with its customers. One form of collaboration is for the industrial depots to calculate their upcoming requirements based on their plans for inducting weapons systems for maintenance, together with the specific maintenance actions that are planned for those systems. Also, information on changes in operating tempo will be factored together with historical demand patterns, to build a more accurate picture of expected demand for specific parts by both operating and industrial customers.

One reason why demand planning is so complicated is that demand is affected by numerous variables beyond the control of DLA or its customers. Current or reliable information upon which to act may not exist. For example, the resources budgeted by a Military Service for a set of planned maintenance actions at a depot may decrease or increase with little prior warning to the depot—and therefore with little warning to its supplier, DLA. Or the Service materiel commands or the operating forces may require,

based on changing operational needs or budget shifts, that certain weapon systems or specific maintenance actions be added, accelerated, or delayed in the workload queue at a depot.

These decisions are often made with only a few months of warning, and are affected by changes in Military Service priorities, including operational priorities or requirements, changes in DOD (Secretary of Defense) budget or other priorities, and the consequences of congressional actions (e.g., sequestration). If any of these actions take place within the lead time for ordering parts at DLA (without sufficient advance notice), then the demand forecast may become inaccurate, potentially leading to excess inventory or backorders. From the perspective of both DLA and its customers, many of these perturbations are facts of life that are beyond their control. In other words, imperfect demand planning need not be the result of errors committed in the demand planning process—imperfect planning is distinct from “bad” planning.¹⁵

Another fact of life is that surprises occur when maintenance or repair actions at the industrial depots, at the unit (organizational) level, or at field (intermediate) level maintenance are begun and unexpected discoveries are made that require additional and unplanned work. This is especially prevalent in older systems, according to officials throughout the logistics (supply and maintenance) system. For example, aircraft and other systems that are 20 to 40 years old, and are often operating beyond their original design life, have a tendency to experience unexpected maintenance requirements not known until the systems are being disassembled and inspected in a depot. These surprises often affect only one individual unit, so that they may have little predictive value for ordering parts for identical platforms or items in the future.

For example, when an aircraft is undergoing planned maintenance for a wing, the specific maintenance actions and the specific parts required for those actions are calculated and planned in advance. But once the wing is pulled apart at the depot, a structural component, for example, may unexpectedly be discovered to have a problem and require replacement. Although dozens or more aircraft of the same type may be undergoing the same maintenance procedure during the same year, with more to follow in future years, it is often unknowable how many additional aircraft will need the same structural component replaced. The result is that there is no “correct” demand forecast.

To further complicate the demand forecasting process for obsolete parts on systems that are being extended beyond their original design life, the original manufacturers may

¹⁵ The production planners at one depot interviewed by the IDA team explained that when they make forecasts of the depot’s workload and work flow, these forecasts can be as much as 50 percent off only months later. The accuracy of any estimate they make of the parts they require from their DLA supplier is necessarily affected by this fluctuation (churn) in activity.

no longer exist, technical data on the parts may be incomplete, and/or materials and manufacturing processes may have changed in the decades since the original part was manufactured. This is often the case for structural components, for example, that were never planned for replacement. Lead times for the manufacture and testing of these parts can be extremely long, especially when the U.S. Government wants to buy only one or two of an item.¹⁶

Further complicating the demand planning process is that many items do not have statistically forecastable demands because they are ordered infrequently and in small quantities, or their demand is highly variable (e.g., zero or one units per month, but then 100 units once every two years). For inexpensive items this has little impact because a larger number of items can be inventoried at little cost. But for expensive parts, maintaining large (enough) inventories may not be an option. The implications of this complexity—another fact of life—for inventory management are discussed below.

Finally, however, there are variables that are under the control of DLA and the Military Services, and the Services may not be forecasting their requirements with sufficient accuracy; this compounds the fact of life challenges discussed previously. The challenges of demand forecasting are discussed further in the next chapter.

b. Inventory Management

Decisions about how much to buy and when are based on demand planning (forecasting), inventory objectives, desired stocking levels and placement, economic order quantities, and other factors. These decisions are reached through an internal collaborative process at DLA involving the line organizations—the buying commands¹⁷ and the Distribution Command—and various headquarters support functions. The Logistics Operations (J3) staff leads this process with modeling and analytical tools that help DLA in its efforts to optimize inventory levels, placement, and buying objectives.¹⁸

Of the 6 million items managed by DLA, some 1.2 million are stocked. This latter number includes four broad categories of items:

¹⁶ This can also lead to very high prices per unit, as engineering, test, and related costs may be high and need to be spread over a very small number of units.

¹⁷ “Buying Commands” refers to the DLA Troop Support Command, the DLA Aviation Command, the DLA Land and Maritime Command, and DLA Energy. These are also referred to as supply chains and “Activities.”

¹⁸ For example, with the help of Logistics Management Institute, the RAND Corporation, and others, DLA has developed sophisticated inventory modeling techniques that address the problem of demand planning and inventory management for items that have highly variable or erratic demands, and for items that have extremely low demands. In another example, the Distribution Command and the Strategic Network Optimization initiative at DLA have rationalized and brought increased efficiency to transportation logistics inside DLA.

- First are items with high and/or regular demand patterns, making them relatively easy to forecast; i.e., they are similar to high velocity products sold in a commercial environment.
- Second are items that are stocked to specific levels to ensure that customers do not run out of important items, even though they may be expensive and/or their demand is difficult to forecast. In other words, certain low demand/high value items are stocked to specific levels based on a case-by-case decision-making process involving DLA and its customers that supplements, or even supplants the results that the models might give.
- The third category includes items that are relatively hard to forecast because their demands, although frequent, are sporadic. (These are referred to in DLA modeling as “Next Gen” items.)
- The fourth category includes items that are relatively hard to forecast because they have both infrequent demand and sporadic demand (e.g., years between demands). These are referred to as “Peak” items. In these last two categories (NextGen and Peak), DLA employs algorithms and statistical analyses designed to make the most efficient decisions possible based on the limited demand information available.

The inventory management process also utilizes economic order data to adjust its stockage objectives. Analyses are conducted on the tradeoffs between ordering in larger quantities (which may result in lower per unit prices), the carrying costs of investing capital in that order quantity for a particular stocking level objective, storage costs, the risks of having a stockout (backorder) before another order can be placed and received from the supplier, and the risks of ending up with excess inventories that must eventually be disposed of. However, as noted later in Chapter 3, the costs of work stoppages and workarounds borne by the Military Services themselves, at their industrial activities and by the operating forces as a result of any stockouts, are not systematically available as an input to the inventory management process.

Finally, the inventory management system considers where items should be stocked (warehoused). These analyses consider, among other factors, where the final demand for items is likely to occur and how to optimize transportation costs.

c. Contracting

DLA’s buying commands process approximately six million contract actions per year. A “contract action” is the creation of or modification to a contract, as well as any purchase made against an existing contract. So, for example, a long-term contract with a supplier

that has many products included in the contract could have hundreds of contract actions per year.

Most contract actions are automated, and one of DLA's ongoing performance goals is to increase the proportion of automated awards. Decreasing the amount of manual involvement in contracting actions helps DLA to meet another important performance goal, which is to reduce lead times in awarding contracts. Reducing the amount of time it takes to award contracts is one of DLA's most important initiatives to improve customer responsiveness and reduce operating costs.

d. Storage and Distribution

DLA Distribution operates warehouses and, though its partner, the Surface Deployment and Distribution Command (SDDC), a functional component command of USTRANSCOM, coordinates transportation. The buying commands—the Aviation, Land and Maritime, Troop Support, and Energy Supply Chains—contract for and manage items and the DLA Distribution Command receives, stores, and distributes those items as needed by DLA's customers. The main exception to this system is items that are provided directly by contractors to the final customers via (DVD contracts; e.g., medical supplies to individual hospitals, food to individual bases, tires to individual units, and other large volume commercially available products. A large portion of DLA's business involves items that it never “touches.” DLA Distribution's systems provide asset visibility over the items in the DLA inventory; thus, if an item has a high enough priority attached to it, the distribution system is capable of delivering any item from its shelves to any customer within 24 to 48 hours.

Regardless of whether DLA touches a product, it is ultimately responsible for ensuring that product is delivered on time to the customer. DLA's rationalization and optimization of transportation networks and costs, in partnership with SDDC–TRANSCOM, is thus a critical feature of its distribution responsibilities.

e. Information Technology (IT) and Enterprise Resource Planning (ERP)

DLA's ERP system is called the Enterprise Business System (EBS). EBS provides a consistent DLA-wide set of the tools, systems, and business rules used not only by the buying commands to perform their contracting responsibilities but by the entire DLA organization. This includes the inventory management and financial control processes and rules. J6 Information Operations is responsible for the maintenance, development, and operation of EBS.

Prior to the development of EBS in the mid-2000s, DLA found it difficult to operate as a unified organization employing standardized processes. The development of EBS enabled DLA to adopt standard processes that could be employed and enforced across all

its business areas. This allowed for the centralized management and control of a great portion of DLA's activities. As a successful ERP implementation, the EBS operating infrastructure became the backbone upon which DLA's core capabilities—demand planning, inventory management, contracting, and storage and distribution—could operate in a synchronized fashion. As a business enabler, DLA's successful implementation of its ERP has had a profound effect on DLA's capabilities and the way its business is operated and managed.

B. DLA's Organization and Governance

1. The DLA Organization

Reporting to the DLA Director are six primary line organizations and numerous staff organizations (Figure 1). Four of these line organizations are the buying commands (also known as buying activities and supply chains)—Aviation, Land and Maritime, Troop Support, and Energy—that are directly responsible for meeting their Service customers' needs for spare parts, fuel, food, medical supplies, and other commodities. The Distribution Command provides storage and distribution services, and DLA Disposition Services is engaged in "reverse logistics," disposing of surplus or excess materiel from the Military Services and DLA.

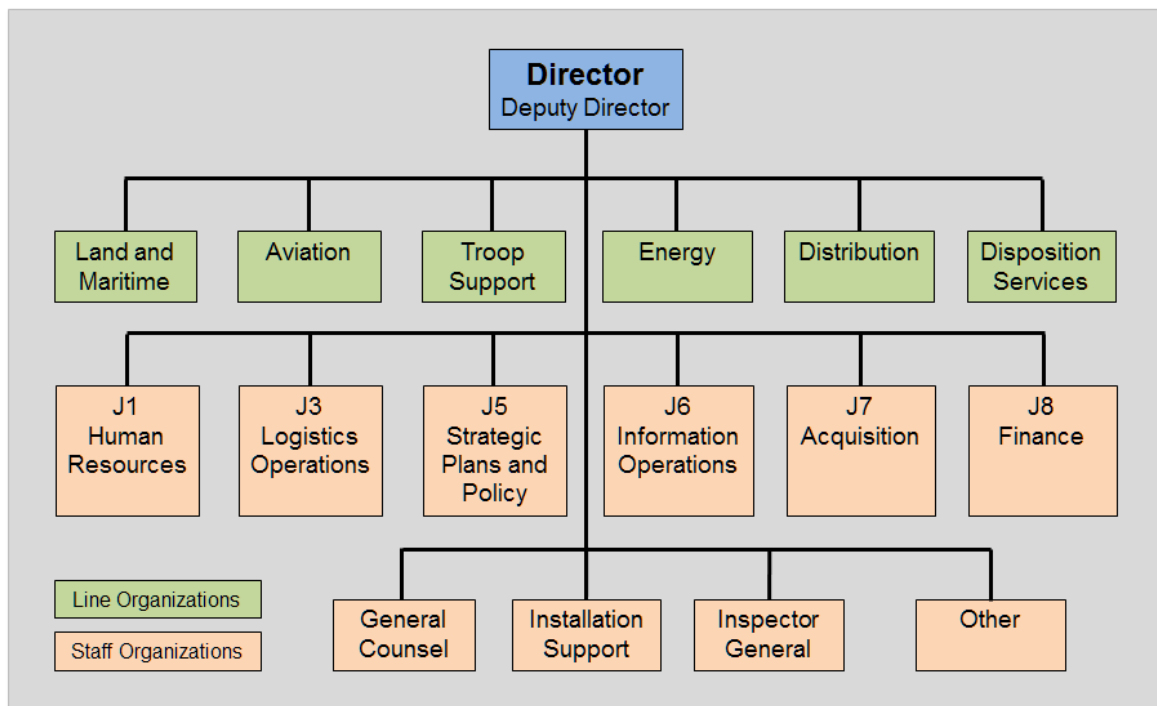


Figure 1. The Main Components of the Defense Logistics Agency

The DLA Director and line managers are supported by several staff organizations. Human Resources (J1), Finance (J8), and Strategic Plans and Policy (J5) perform the functions implied by their names. Logistics Operations (J3) is responsible for coordinating DLA support to deployed forces, as well as support to non-deployed operating forces. It is also responsible for coordinating many of the actions (e.g., inventory management) between DLA's line and staff (headquarters) organizations. Information Operations (J6) is responsible for DLA's IT infrastructure, including, most importantly, the maintenance and development of DLA's ERP system, the Enterprise Business System (EBS). Acquisition (J7) is responsible for procurement and contracting policy and oversight.

DLA's day-to-day work is performed by approximately 20,000 personnel in its line organizations. These are supported by a headquarters staff and other functions totaling approximately 4,000 people (Table 3). The direct line management responsibility for meeting customer requirements rests primarily with the four buying commands. Their customers, once again, comprise (1) deployed forces; (2) other outside CONUS (OCONUS) and CONUS operating forces, installations, and activities; (3) CONUS military industrial facilities; and (4) other customers, including the U.S. Government and FMS.

Table 3. DLA's Line Organizations (FY 2013)

Buying Activities		
	FTEs^a	Revenues (\$B)
Aviation	3,185	3.5
Land and Maritime	2,449	3.1
Troop Support	2,279	13.3
Energy	1,038	16.7
Other Centers		
	FTEs	Costs (\$B)
Distribution	7,119	1.5
Disposition	1,fff433	0.4
Operationalized Support		
	FTEs	
Facilities	1,529	
Information Technology	2,120	
Finance	595	
Functional Support ^b	1,473	
HQs Support	885	
Grand Total FTEs:	24,105	

Source: DLA Finance (J8).

^a FTE: Full Time Equivalent.

^b Joint Logistics Operation Center, operations OCONUS, and other support activities.

a. DLA Aviation

DLA Aviation is located in Richmond, Virginia. Its commander is a one-star flag or general officer who reports directly to the DLA Director. It has approximately 3,200 employees, with sales of approximately \$3.5 billion in FY 2013. It manages approximately 1.1 million items. Nearly all of these are Class IX repair parts, required by the fixed and rotary wing aviation fleets of the four Military Services. DLA Aviation has seven main industrial customers: the three Air Force Air Logistics Complexes, the three main Navy Fleet Readiness Centers, and the Corpus Christi Army Depot. These customers are responsible for approximately one-third of DLA Aviation's sales. Operating forces based in the United States and overseas are responsible for approximately two-thirds of its sales. Some of the items managed by the Aviation Command are supplied to the Land and Maritime Command's customers at the Navy shipyards and the Army and Marine Corps depots.

For all but the Army depot in Corpus Christi, DLA Aviation is responsible for both wholesale and retail supply to its main military industrial customers. That is, it is responsible for getting individual parts into the hands of the artisans or mechanics—the final consumers—who need them to perform specific maintenance or repair tasks. In the case of Corpus Christi, the Army handles its own retail operations, and DLA Aviation is a wholesale supplier to the Army retail store at Corpus Christi.¹⁹ DLA Aviation is also responsible for the wholesale supply of items to the operating forces. Those forces, at their bases and installations, are then responsible for the retail distribution, via their own retail stores, of parts and other consumable items to the final user or consumer.

b. DLA Land and Maritime

DLA Land and Maritime is located in Columbus, Ohio. Its commander is a one-star flag or general officer who reports directly to the DLA Director. It has approximately 2,450 employees and FY 2013 sales of approximately \$3.1 billion. It manages approximately 2 million items. These are Class IX repair parts required by land and naval systems, as well as numerous electronics items required by all systems, including aviation systems. Some of the items managed by DLA Land and Maritime, including many electronics items, are supplied to the Aviation Command and its customers at the Air Force and Navy aviation depots.

DLA Land and Maritime has eight main industrial customers: the four Navy shipyards and four of the Army depots. (The fifth Army depot is the aviation depot supported by the Aviation Command.) DLA Land and Maritime is the wholesale and retail supplier to the four shipyards and the wholesale supplier to the four Army depots. These account for

¹⁹ The term *store* is used here in the generic sense to refer to one or more physical locations used in performance of the retail storage and distribution function.

approximately 30 percent of its total sales. It also supplies operating forces based in the United States and overseas, which account for approximately 70 percent of sales.

c. DLA Troop Support

DLA Troop Support is located in Philadelphia, Pennsylvania. Its commander is a one-star flag or general officer who reports directly to the DLA Director. It has approximately 2,300 employees and \$13.3 billion in FY 2013 sales. It manages approximately 3 million items. It contracts for food and other subsistence (Class I), clothing and textiles (Class II), construction materials and equipment (Class IV), personal items (Class VI), and medical supplies (Class VIII) for its customers in all four Military Services. In addition, it is responsible for the purchase of certain Class IX repair parts, primarily industrial hardware and fasteners.

d. DLA Distribution

DLA Distribution has its headquarters in New Cumberland, Pennsylvania. Its commander is a one-star flag or general officer who reports directly to the DLA Director. It is responsible for the storage and distribution of all DLA-stored items. It has approximately 7,100 employees spread across 25 distribution centers worldwide, 18 of which are in the United States. The two largest distribution centers are in San Joaquin, California and Susquehanna, Pennsylvania; they are Strategic Distribution Platforms where the largest portion of warehoused items are stored before being re-packaged (if necessary) and delivered to DLA's customers around the world. DLA Distribution's costs in FY13 were approximately \$1.5 billion. These costs are recovered through surcharges to its customers for the specific products stored and delivered by DLA, meaning they are not added to the costs that DLA recoups via its cost recovery rate on items sold by DLA.

e. DLA Disposition Services

DLA Disposition Services has its headquarters in Battle Creek, Michigan. Its commander is a civilian Senior Executive Service, who reports directly to the DLA Director. Its business is to dispose of excess DOD property. DLA Disposition follows a statutory disposition process whereby property is initially reutilized within DOD and federally-established Special Programs, then offered for transfer to other federal agencies, and finally donated to authorized state and local governments, and to other organizations, before being offered for sale at auction or destroyed as scrap. Disposition Services has played a major role in the demilitarization and disposal of large quantities of equipment and other items in Iraq and Afghanistan.

Disposition Services has approximately 1,400 employees and annual costs of about \$400 million. These costs are recovered through Service Level Bills passed directly to the Military Services, meaning they are not added to the costs that DLA recoups via its cost

recovery rate on items sold throughout the rest of DLA. Through its sales of surplus items and scrap, Distribution Services generates about \$100 million per year in revenue. These revenues offset the costs passed back to the Military Services.

f. DLA Energy

DLA Energy acquires, stores, and distributes bulk petroleum worldwide and collaborates extensively with other DOD components in the planning, management, and operation of fuel infrastructure and support capabilities. Over time, DLA Energy and its predecessor organizations have taken on additional missions beyond bulk petroleum, including contracting support for installation energy in the form of electricity, natural gas, and coal. Its aerospace division manages the U.S. Government supply chain for liquid propellants, cryogenics, chemicals, and gases for space launch applications.

DLA Energy's commander is a one-star flag or general officer and employs a staff of approximately 1,000 worldwide. In addition to its internal support units, the organization divides its main activities across Customer Operations, Supplier Operations, and four regional commands (Americas, Pacific, Europe and Africa, and Middle East).

With approximately \$17 billion in sales in FY 2013, DLA Energy accounts for close to half of DLA's total sales. Customer shares are relatively stable, with the Air Force accounting for close to half of sales, the Navy for another quarter, and the Army, Marine Corps, and all other customers for the final quarter. The large majority of those sales are for petroleum products, approximately 75 to 80 percent of which is aviation fuel. In total, DLA Energy customers purchased just over 100 million barrels of petroleum products in FY 2013. Almost 90 percent of that total is bulk petroleum, for which DLA Energy manages the entire supply chain for DOD.²⁰

DLA Energy also manages approximately 600 Defense Fuel Support Points (DFSPs) worldwide, ranging from simple base gas stations to major fuel farms and terminals. Around two-thirds of the DFSPs are located on military bases, but others are located in major port facilities, along pipeline routes, and afloat. Most DFSPs are government owned, government operated (GOGO), government owned, contractor operated (GOCO), or contractor owned, contractor operated (COCO).²¹ Across these different types of operations the day-to-day responsibility for operation or oversight of these facilities is divided among DLA Energy and the three Military Departments.

²⁰ *DLA Energy Fact Book, FY 2013*. Net sales in FY 2010–13 were \$15.4 billion, \$19.3 billion, \$18.8 billion, and \$16.7 billion.

²¹ Approximately 20 percent of DFSPs are NATO (North Atlantic Treaty Organization), commercial pipelines, floating storage, or owned by a foreign government.

In addition to management of the bulk petroleum inventory stored in the global network of DFSPs, DLA Energy also manages the maintenance of that infrastructure. It fulfills that responsibility, in cooperation with its Military Department partners, through the Sustainment, Restoration, and Modernization (SRM) program. SRM projects account for close to \$500 million in expenditures annually and are pursued in one of four pillars:

- Centrally Managed Programs address a wide range of inspections and other regulatory compliance activities.
- Planning Studies provide comprehensive infrastructure reviews every five years to identify infrastructure restoration and modernization investment priorities.
- Recurring Maintenance and Minor Repair covers small-scale maintenance.
- Emergent projects are those identified outside the other preventative-oriented pillars.

2. Governance Structure

The organization chart previously depicted in Figure 1 shows many of the line and staff managers who report directly to the Director of DLA. The highly integrated nature of DLA's systems and functions requires a high degree of collaboration for the organization to work well.

The fact that EBS provides the information operating infrastructure for all of DLA's work is one clear example of this. EBS provides the ability to collect, store, and manage vast amounts of information, as well as provide the platform for operating DLA's core capabilities. DLA is thus able to work with a large number of metrics that measure seemingly every aspect of its business. These metrics are widely shared throughout the organization. Decision-makers are able to obtain all available information before making decisions, and standardized internal processes ensure that this information sharing and collaboration takes place.

At the top level is the Executive Board, which is chaired by the Director and includes all direct reports and most of their deputies. The Executive Board meets quarterly to review major issues and decisions facing the agency, and to review performance measures from each of the operating units (including the four buying commands, Distribution, and Disposition) and the various headquarters staff functions.

Below the Executive Board is the Alignment Group, which is chaired by the Vice Director and also includes the direct reports to the Director; i.e., the line managers and the senior staff directors. Here decisions are made on a wide range of issues, and recommendations are formed to take to the Director for final decisions.

Below the Alignment Group is a wide range of committees and groups devoted to all the different aspects of DLA's business—demand planning, inventory management, contracting, and storage and distribution—together with the necessary support functions, such as Finance (J8), Human Resources (J1), and IT/ERP support.

All cross-cutting committees and groups that are not able, or do not have the authority, to make final decisions bring their issues and recommendations to the Alignment Group for resolution. On some issues the Director is directly involved, such as, for example, inventory management and the setting of inventory levels, increasing long-term contracts and automation, and reducing contracting times in the Time to Award effort. In the inventory management example, there is an Inventory Management Council, whose composition is similar to the Alignment Group, although it is chaired by the Director and has additional attendees who bring technical expertise and information.

C. DOD Policy and DLA Responsibilities

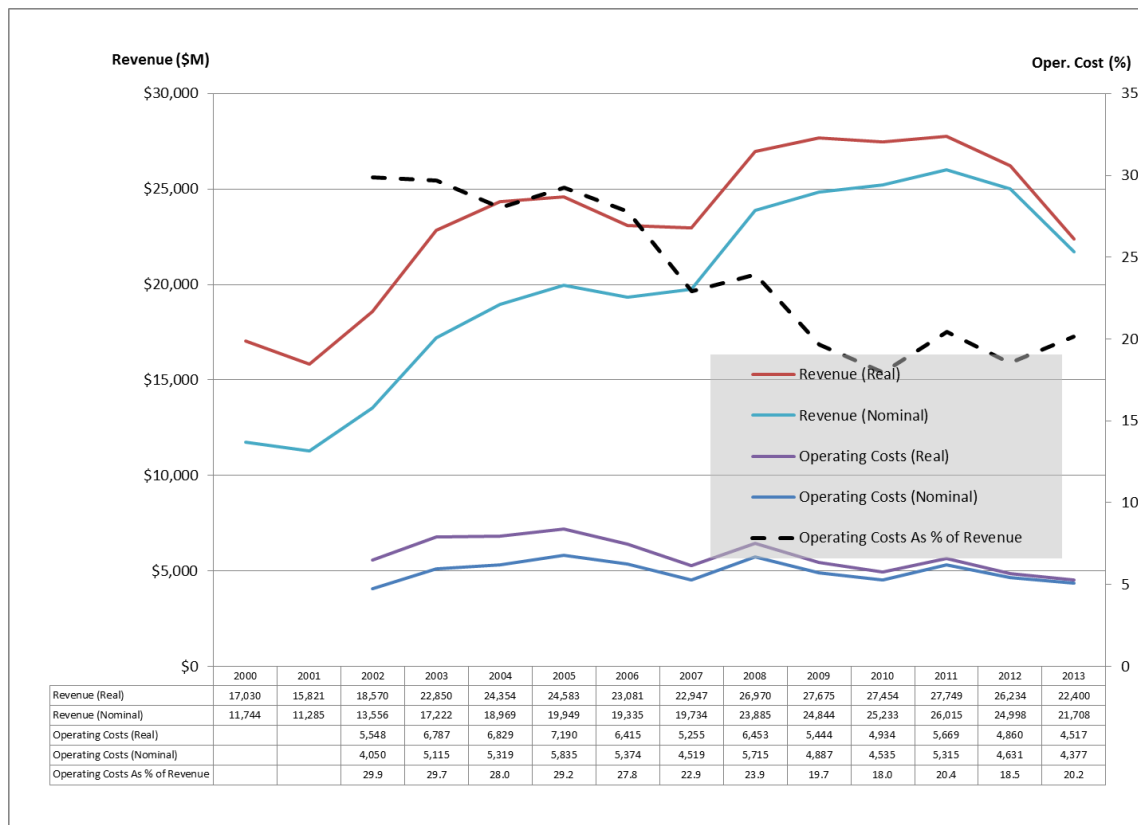
1. Consolidation and Economies of Scale

Over the years DOD has sought to take advantage of the economies of scale in consumables item management by consolidating responsibilities from the Military Services into DLA. The fundamental idea behind this succession of policy decisions was eliminating redundant fixed costs where the Services and DLA were performing identical or similar functions. DOD could thus take advantage of the low marginal cost to DLA of increasing its business activity while reducing DOD-wide fixed costs.

A second idea underlying this policy is that, in addition to economies of scale, consolidating responsibilities into DLA puts DOD in a stronger negotiating position with its industry suppliers, since there is only one DOD entity involved versus four or five (DLA and several of the Military Services). This “single face to the contractor” principle underlies some of the decisions made in the 2005 BRAC.

Figure 2 shows DLA non-Energy revenues and operating costs since FY 2000 in real (inflation adjusted) and nominal (then-year) dollars. While revenues increased dramatically after 2001—the impacts of the conflicts in Afghanistan and Iraq are obvious—the effects of this increase in activity on operating costs are more difficult to discern. From 2002 to 2013, real revenue increased by 21 percent and real costs decreased by 19 percent. Operating costs as a percent of revenue have been generally declining, which is consistent with the observation that most costs are fixed; i.e., there is little impact on the cost structure of increases or decreases in revenues. Of course, there is a lot of movement in these data, reflecting a number of other phenomena. For example, some portion of the increase in operating costs in fiscal years 2003–2006 is associated with investments in the (then new) EBS. The increase in costs from 2007 to 2008 is partially explained by the transfer of

supply, storage, and distribution, and depot-level reparable (DLR) missions that resulted from the BRAC 2005 decisions.



Source: DLA J8 (Finance).

Figure 2. DLA Costs and Revenues

The relationship between its revenues and its operating costs illustrates that with its fixed cost structure, DLA is able to absorb large increases in its business with little effect on its own operating costs; i.e., it has very low marginal costs. While changes in revenue reflect changes in its customers' activities (e.g., increased operating tempo will translate into increased demand for fuel and repair parts), revenue changes do not provide an accurate picture of DLA's own internal activities.

To see these points, consider a simple illustration. If DLA's customers are buying 1,000 units of a particular item (NSN—National Stock Number) per year, DLA might make two purchases per year of 500 units each. If the demand for the item doubles, then DLA might purchase 1,000 units twice a year. The marginal cost to DLA of a doubling in its business, if not zero is very close to zero, in this simple example. The number of contract actions is identical and no additional contracting workload is imposed upon DLA, although storage and distribution activities may increase slightly. If DLA were to buy 500 units four

times a year, the number of contract actions would double. Depending upon how highly automated the buying process is for this particular item, DLA's marginal costs might be slightly higher than zero.

Several 2005 BRAC decisions resulted in additional shifts of responsibilities from the Military Services to DLA. Additional consumable items—specifically tires; packaged petroleum, oils, and lubricants; and gases and cylinders—were moved to DLA from the Services. Note that the items in question are all high volume, commercially available products. A variety of consolidations in the wholesale warehousing system were also instituted.

2. Expanded DLA Responsibilities

One of the most distinctive BRAC 2005 decisions was to assign to DLA the responsibility for retail supply at the Military Services' industrial depots. In 2008 DLA took over the retail mission for the Air Force and Navy aviation depots and Navy shipyards. The Army and Marine Corps retained their retail responsibilities. DLA's progress in meeting its retail customers' requirements at the Air Force and Navy industrial sites is an important issue addressed in this paper.

What made this decision so distinctive was that it involved more than just a consolidation of existing responsibilities. It gave DLA a new function: retail support. The previous consolidations had all involved wholesale functions—the buying, storing, and distribution of goods to be sold or provided, to be retailed, by someone else to the final consumer.

BRAC 2005 thus moved the boundary of DLA's responsibilities into a new and critically important area. DLA's core capabilities of demand planning, inventory management, contracting, and storage and distribution—enabled by its governance structure and successful IT/ERP system—provided the foundation which gave the DOD leadership confidence that this different kind of consolidation would be successful. DLA has made substantial progress in meeting these new responsibilities, although it still has important challenges to overcome.

The other controversial decision from the 2005 BRAC was to move the contracting for DLRs from the Military Services to DLA. The original BRAC decision was that both contracting for new DLRs as well as the contracting for the repair of reparable (the repair of DLRs) would be transferred to DLA.²² The underlying assumption was that DOD would

²² A DLR is an item (not a weapon system) that, once purchased, can be repaired (e.g., an auxiliary power unit or aircraft brakes or vehicle transmissions). Its lifetime is not infinite, however. It will be repaired some number of times until it needs to be replaced by a new DLR. The repair of DLRs—the repair of reparable—may be performed by a Service depot, or it may be contracted out by the depot to private

benefit by having “fewer faces to the supplier” which would result in fewer contracts, an improved negotiating position, and therefore lower prices and costs. The Services were opposed to this change because of their integrated contracting and requirements setting processes. The Services were concerned the change would lead to poor responsiveness to customer (i.e., Service) needs, particularly in the case of the repair of reparable, which is an integral part of depot planning, resource management, and ultimately combat readiness.²³

DLA now has the responsibility for purchasing, or contracting for, new DLRs, but with two restrictions: (1) the Military Services set all the requirements, and (2) DLRs are purchased using Service funds, so that ownership of the DLRs remains in the hands of the Services. In other words, DLA does not purchase and stock DLRs using its own working capital fund (and then have the Services purchase those DLRs from DLA stocks as needed), as is done with other DLA stocked items. (DLA is still responsible for storage and distribution of DLRs, although they remain on the Service books.²⁴)

All responsibility for the repair of reparable, including contracting, remains with the Military Services. This decision means that the BRAC goal of reducing the number of “faces to the supplier” was not fully realized. If all four Services use an item, the number of contracts with a single supplier for new DLRs drops from four to one, but there might still be four more contracts for the repair of reparable.

Countervailing factors to the underlying assumptions in the BRAC 2005 decisions must be considered. Many of the firms performing repair of reparable work, especially the OEMs (original equipment manufacturers), have numerous other contracts with the Services for research, development, test and evaluation, procurement of end items, technical support, end item repair and modifications, and more. Thus, even if all repair contracting was to move to DLA, the Military Services might still have more contracts with some of the OEMs than would DLA. The logic for showing “a single face to the supplier” is important, but the question of where that single face is located, or which organization

industry. The decisions on where to perform this work—how much repair of reparable work to perform in house, and how much to contract out to industry—are critical to the efficient management of its depots by each of the Services.

²³ Note that there has never been any consideration of DLA’s involvement in the actual repair of items or in other maintenance activities, including requirements. The issue here is solely who will perform the *contracting* function for new DLRs and the repair of DLRs.

²⁴ Of the approximately \$97 billion in inventory held in DLA warehouses, \$85 billion is Service-owned items, including DLRs, being stored for the Services by DLA, and \$12 billion is DLA-owned inventory.

can take greatest advantage of that single face and for which combination of contracts, does not have a simple answer.²⁵

D. How DOD, DLA, and the Military Services Measure DLA Performance

1. Metrics

DLA, its customers, and OSD use a large number and variety of metrics to evaluate nearly every aspect of DLA's performance.²⁶ Some of these measures are useful in gaining an overall picture of DLA's performance, whereas many others are more useful to managers in fine-tuning DLA's business practices and its interactions with its customers and vendors.

No one measure or set of measures can provide enough information to definitively evaluate DLA's performance. Certain measures are able to provide insights or indications of important performance issues, but these need to be combined with more qualitative information in order to arrive at a meaningful assessment of DLA performance.

For example, DLA and its Military Service customers have agreed-upon metrics they use to maintain a shared understanding of how well DLA is meeting its customers' requirements.²⁷ *Material availability* is one such measure, as are *backorders* and *order response time*.²⁸ Internally, these and other measures are used by the DLA leadership to hold the buying commands²⁹ accountable for their performance, and to determine if headquarters support functions (e.g., contracting, IT) are providing the policies, procedures, tools, and other support necessary to improve these measured outcomes. These metrics are useful in providing the basis for more in-depth evaluations of where DLA's performance can be improved.

²⁵ The authors are grateful to colleagues at the RAND Corporation for providing this more nuanced understanding of the issue.

²⁶ To cite but one example, the "Monthly CIMIP [Comprehensive Inventory Management Improvement Plan] and Metrics In-Progress Review" is a 150-page briefing (the February 18, 2014, version) with scores of measures covering, among other matters, inventory, storage, response times, and transportation.

²⁷ These are spelled out in Performance Based Agreements. See, for example, "Director of Logistics, United States Air Force (AF/A4L), and Director, Logistics Operations, Defense Logistics Agency (DLA J3)—Performance Based Agreement (PBA)," 20 September 2013.

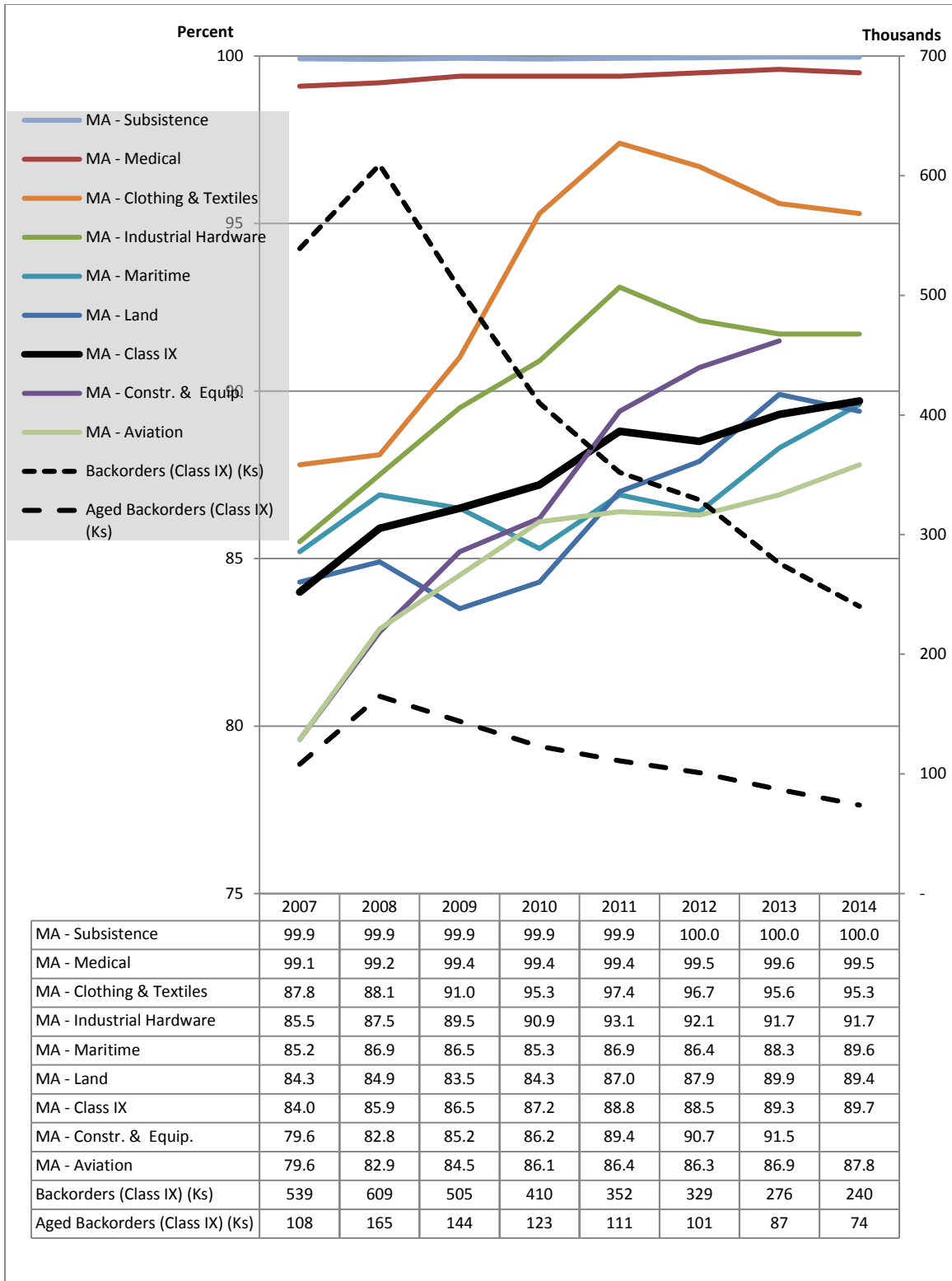
²⁸ Material availability refers to whether an item is available for immediate distribution—i.e., an item is either "on the shelf" or it is in route and can be delivered on time. If an item is requested by a customer and is not available, it becomes a backorder. This may include items that have already been ordered but have not arrived and are thus not available for distribution. Order response time measures how long it takes for an order, once placed by a customer, to be delivered.

²⁹ DLA Land and Maritime, DLA Aviation, DLA Troop Support, and DLA Energy.

Externally, with its customers, these metrics are used to have a structured conversation about how successfully DLA is meeting its customers' requirements. An important point here is that neither DLA nor its customers see these few metrics as being the entire conversation. Whether these high-level metrics are trending in the right or the wrong direction, they are a starting point for more in-depth conversations about customer needs, DLA performance, and how to improve maintenance outcomes or operational readiness.

Standard metrics employed by DLA and its Military Service customers suggest that DLA's performance has been improving over the past several years (Figure 3). Material availability for Class IX repair parts, for example, is close to the goal of 90 percent. (Several years ago DLA's goal was to achieve 85 percent material availability.) Backorders, to cite another example of a commonly used measure, have been reduced by 32 percent since 2010, and by 55 percent since 2007. Aged backorders (the subset of all backorders that are more than 180 days old) have been reduced by 40 percent since 2010 and 32 percent since 2007. Note that material availability for subsistence (food) and medical items is over 99 percent, reflecting the fact that they comprise high volume, commercially available products for which there is little or no unique DOD demand. (Most of these items are on prime vendor contracts handled by DLA, which means they pass directly from the vendor to the customer; i.e., DVD.) Class IX repair parts, in contrast, include a much larger component of smaller volume and less predictably demanded items, many of which are unique to the military and therefore have no commercial demands.

Judging DLA's performance from these and other metrics is complex. DLA's mission is to supply parts and other consumables as efficiently as possible to its customers. Consequently, it will make the best use it can of its limited financial resources to maximize material availability, minimize backorders, and maximize order response times. But DLA's higher level goal—as an integral component of the DOD logistics and maintenance enterprise—is not to optimize its own supply chain but to work with its customers to optimize enterprise-wide supply, maintenance, and readiness outcomes. Thus, even if material availability and backorder statistics are trending in the right direction, one still needs to assess carefully how that is being done. DLA would not want to improve its own efficiency at the cost of sub-optimizing depot efficiency or the readiness of operating forces.



Source: DLA J7 Acquisition
BO – backorder K – thousand MA – material availability

Figure 3. Material Availability and Backorders

To overcome this challenge, DLA's inventory management methodology incorporates a number of variables that attempt to reach inventory levels that are optimal for its customers. There are several kinds of variables or constraints. First, items that are required to be stocked, either because of forecasts based on historical demand or the identification of discrete products by the buying commands, are constrained so that the inventory levels do not drop below the levels set for safety stocks. Another constraint is to satisfy group demands—bundles of products that need to be maintained in inventory together or with reference to one another. The primary fiscal constraint is one which simply does not allow the model to spend more than is available. Another constraint is the individual stock keeping unit constraints. The buying commands (supply chains) are also able to impose their additional constraints, so as to alter where to take certain risks or to respond to immediate customer requirements.³⁰

This optimization effort attempts to take into consideration the importance of every item to DLA's customers by placing items in one of the above categories for prioritization. However, the information underlying these priorities—primarily historical demand patterns as modified by customer identification of changing requirements (collaborative demand planning)—is not able to evaluate the cost or penalty to the depots or operational users of stockouts of individual items. Thus, material availability, while a useful metric, has a limited ability to indicate whether the customers' needs are being optimized. More is better, and material availability has been trending in the right direction in recent years, but without information on the cost effect of stockouts on its customers, more analysis is required to know if a different mix of inventory would represent a better optimization solution.

Customers understand that 100 percent material availability is impossible. On the other hand, when customers do not have a required part or item, they still look to their supplier and ask why it is not there. To a mechanic or artisan who truly needs a part, 90 percent material availability has little meaning.³¹ DLA's traditional wholesale metrics, on their own, do not provide sufficient insight into or measurement of whether DLA is meeting its customers' requirements, particularly in the case of DLA's retail customers at the depots. This is an important theme that is discussed further in the next chapter, where suggestions are made for developing and incorporating additional measures into the DLA management system.

³⁰ Source: Discussions with inventory management staff in DLA J3 Logistics Operations.

³¹ *Admiral*: "How many parts does it take to keep that engine repaired?"

Captain: "Uhm, I will have to get back to you with that number, sir."

Admiral: "Relax. The answer is all of them."

This story is attributed to VADM Mark Harnitchek, prior to his becoming the Director of DLA.

2. Cost Reduction Efforts

Every defense agency, Military Service, or other component in DOD is under constant pressure to reduce its costs. From a management and organizational perspective, two questions are paramount when looking at cost reduction efforts. The first is whether the organization and its senior leaders and managers face the necessary incentives to make cost control and reduction an important and meaningful goal. The second is whether the organization has good visibility into (data on) its costs. By these criteria, DLA is well positioned to manage its costs: DLA Directors face strong incentives from their superiors in OSD and the U.S. Congress to reduce costs, and DLA's IT/ERP system provides it with extensive data on numerous aspects of its costs.

DLA has undertaken a significant initiative to reduce costs. For example, under the title of "Big Ideas," senior executives at DLA are held accountable on each of their efforts to reduce operations costs (e.g., people, facilities, supplies) and materiel costs (e.g., the costs of items purchased from vendors for re-sale to the Military Services and other customers). With a significant amount of senior management time and attention devoted to this effort, DLA leadership is signaling to the entire organization that cost reduction is an important goal. "Agency Performance Reviews" and "Big Ideas" briefings are regular features of Executive Board meetings and other reports to the Director. They track metrics on the cost reduction goals and achievements of each organization within DLA.³²

DLA reports both internally and externally on the savings it is generating from these initiatives. The IDA team did not seek to validate those cost savings. Rather, it observed, on the basis of interviews with large numbers of senior DLA managers, that the management culture of DLA includes a large element of cost reduction in both the day-to-day and long-run perspectives of those charged with the operation of the agency.

³² See, for example, "Directors Guidance 2014" and "Defense Logistics Agency (DLA) Big Ideas," briefing, presented by Finance (J8), July 29, 2014.

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3. Major Findings

A. Introduction

This paper has three major findings with respect to DLA's performance and organizational capacity.

- DLA possesses the skills and capabilities required to perform its core functions: demand planning, inventory management, contracting, and storage and distribution. Its governance structure is well suited to its tasks, making it possible for decision-makers to operate with the information they need, and it has an enterprise resource planning system, the EBS, that successfully provides the IT infrastructure to run the entire operation.
- DLA has made significant progress in improving its customer focus over the last several years. Particularly noteworthy are efforts to improve retail support to military industrial facilities customers.
- DLA's retail customer focus needs further improvement and institutionalization. Continued commitment to changes in business practices will be required for this to happen. In particular, DLA's wholesale orientation (culture) requires continued change management to adopt more effective retail processes and focused customer support.

B. Performance and Organizational Capacity

1. DLA Possesses the Basic Skills and Capabilities Required to Perform Its Core Functions

Demand planning and inventory management require sophisticated modeling and operations research capabilities that DLA has developed and improved for many years. Numerous facts of life affect the Military Service customers and make demand planning and inventory management less accurate than anyone would like, e.g., budget shifts that cause the demand for depot services to change with little warning, parts with very low or highly variable demands, and aging systems that bring a constant stream of unexpected and one-off requirements.

A common view held by the Military Services is that DLA has a "90-10" problem: it is good at supplying the 85 to 90 percent of the items that are high volume and low cost,

but has problems with the 10 to 15 percent that are low volume and often high cost. From the customer perspective, this is why they perceive DLA's backorders to be higher, and material availability to be lower, than they would like. (It is noteworthy that DLA material availability is currently around 90 percent.)

The difficulties DLA encounters in satisfying the final 10 percent of demand—in raising material availability above 90 percent—result from a complex set of factors involving the four core functions (demand planning, inventory management, contracting, storage and distribution), the availability and reliability of technical (engineering) data, and the availability of manufacturing sources. These are universal challenges that are encountered by both DLA and the Military Services. A large portion of the final 10 percent is the result of unavoidable facts of life, and not due to poorly designed or executed systems or processes. Many of these items are indeed low volume (and high cost), which is precisely why it is difficult to forecast their demand and always keep them in stock.

DLA's storage and distribution system successfully performs its basic functions. With complete asset visibility and efficient transportation networks, an item in the DLA inventory can typically be delivered to any CONUS customer within 24 to 48 hours, depending upon its priority.³³

With respect to DLA's contracting practices, the biggest challenge is the time it takes to place awards and receive delivery from the suppliers. As the time to award is lowered, material availability improves, and/or items on backorder are acquired more rapidly. DLA has, in the last few years, increased its level of long-term contracts and automated awards, and continues to recognize the importance of this challenge, as evidenced by the Time to Award reengineering effort and the emphasis placed on the regular review of relevant buying command performance metrics. There is much that DLA can still do to reduce the time and costs associated with its contracting practices.

However, it must also be recognized that some of the impediments to more rapid contracting are outside of DLA control. In particular, DLA contracting times suffer significant delays because technical data maintained by the Services is often unavailable in a timely and reliable fashion.³⁴ In these cases, the time it takes DLA to verify the technical data before it can issue a contract award is considerable. In other cases, Critical

³³ Distribution's ability to deliver stocked items quickly is distinct from the inventory management system's rules for cost-effective delivery quantities. For routine priorities, the decision rules may insist on waiting until an efficient order quantity has been reached before filling an order and delivering the items.

³⁴ The problems with technical data and specifications are discussed in more detail in the next chapter. The issue is that even if DLA has direct access to Service technical data, if it does not know whether that data can be used—if it is not confident that the data is up-to-date and accurate—then it must take the time to find out, which unnecessarily delays the contracting process. The technical data may be reliable but the database is not viewed as reliable if users do not *know* whether they can rely on the data they find there.

Application Item (CAI) designations or First Article Test procedures provide further impediments to timely contracting actions. (See the Time to Award section in the next chapter.)

Reductions in time to award are important and will pay valuable dividends, but they are only one piece of the puzzle. Another important factor is the accuracy of Military Service demand planning. This also has an effect on DLA inventory management. There will always be demands generated late; that is to say, inside the lead time required to purchase the parts.

Finally, DLA, like the Military Services, is struggling with the problem of manufacturing sources for many old or obsolete parts and products. Particularly for aging weapon systems, parts may be required for which technical drawings are out of date, unavailable, or non-existent; the original manufacturers may no longer be in existence; and the combination of high complexity and low order quantities leaves potential manufacturers uninterested in or unable to provide timely production and delivery.³⁵ Innovative contracting strategies will help, but the underlying problem of aging systems is not within the power of DLA or the Service maintenance communities to solve.

Although there is room for significant improvement, as evidenced, for example, by its Time to Award effort, DLA's systems for demand planning, inventory management, contracting, and storage and distribution, combined with the enabling capability provided by EBS, are capable of meeting customers' requirements. The 90–10 perceived problem is the result of a complex set of factors that DLA needs to continue addressing, but not all of which are under its control.

2. DLA Has Made Significant Progress in Improving Its Customer Focus over the Last Several Years

There have been a number of organizational and management changes within DLA designed around the central idea of being more knowledgeable about and responsive to retail and wholesale customer requirements. Some of the major actions and initiatives are detailed in the following sections.

³⁵ DLA supply chain and Service maintenance managers are concerned about “the problem of diminishing manufacturing sources and material shortages for aging platforms. With a handful of notable exceptions, there are no new systems planned for deployment for the next 10 to 20 years. This issue will take on additional importance over time and its impact on DLA's performance will continue to increase. The Services and DLA require a continuous and collaborative process to identify critical supply chain sourcing gaps and to develop solutions to close those gaps. Since these solutions may result in engineering changes, it is imperative that the Services take a leadership role... [including] an investment in sustaining engineering to address over the long term.” (Email exchange from a DLA supply chain manager with the IDA authors, September 10, 2014.)

a. Supply Chain and On-Site Commander Authorities

As a result of the BRAC 2005 decisions, DLA in 2008 assumed responsibility for retail support at the Air Force Air Logistics Complexes, the three main Navy Fleet Readiness Centers, and the four shipyards. During the next several years, DLA local commanders often found themselves in the position of knowing that their customers' requirements were not going to be met, but having too little authority to do anything about it. Beyond sending requests up the chain of command for changes to inventory and stocking decisions, there were constraints on what they could do even if they saw a problem coming.

In 2012, the Director of DLA delegated more authority to the buying command commanders and their local commanders at the industrial depots to (1) make local purchasing decisions (also known as emergency buys), and (2) make changes to inventory and stocking decisions being set by the algorithms in EBS.

As an example, local commanders have more authority to direct that specific items be stocked locally (in the local DLA wholesale warehouse), rather than in a single warehouse on the other side of the country. Wholesale efficiency considerations dictate that many items be stored in only one or two locations, often the Strategic Distribution Platforms (warehouses) in San Joaquin, California, and Susquehanna, Pennsylvania. The improved ability of local commanders to meet local demand was not included in the optimization calculus. Now local commanders have a greater capability to be more responsive, thereby improving DLA's effectiveness in meeting customer requirements.

At the same time, however, the algorithms in EBS set inventory objectives and associated rules on purchase quantities and timing for tens of thousands of items at a time, whereas the authority of line managers to make changes is limited to doing so on a case by case basis. "Adjusting the dials" (i.e., adjusting the algorithms) in EBS on the vast majority of items requires the use of a centralized and collaborative enterprise process. The process wherein line managers can make local stockage changes will require additional and ongoing realignment within DLA.

A direct result of the BRAC 2005 decision giving DLA responsibility for retail support in the Air Force and Navy industrial facilities (depots) was increased attention devoted to coordination between DLA and Military Service industrial facility planning staffs. At the local level, demand planning data increasingly is passed more quickly and more effectively between DLA and its customers. Even when databases and IT systems do not line up or communicate well with one another, the fact that DLA and Service planners are attending the same meetings and are able to share information as it becomes available to each partner represents a significant step forward in retail-wholesale-customer-supplier (supply chain) integration.

b. DLA Aviation Command Use of Air Force Retail Metrics

Over the last several years, the Air Force has substantially reengineered the work processes at its three Air Logistics Complexes (in Oklahoma City, Oklahoma; Ogden (Hill Air Force Base), Utah; and Warner Robins, Georgia). Previously the three complexes (depots) operated more independently. They are now subordinated to the Air Force Sustainment Center, a three-star command in the Air Force Materiel Command, which is reengineering and standardizing production processes across the three complexes. One benefit of this reengineering effort—aside from the significant improvements in productivity and process standardization that have benefited the Air Force—is that the three ALCs generate better data on their own internal processes and requirements, which improves the data that they share with DLA.

One important set of metrics used by the Air Force to manage the ALCs is data that show 30 and 90 days into the future where specific “Gates” in the production process are in danger of being missed; i.e., where the flow of scheduled work is in danger of being delayed and interrupted. The use of these data and their value to DLA are discussed in more detail in the next chapter. The Air Force, the local DLA commander at each ALC, and the DLA Aviation Command (in Richmond, Virginia) use these data to anticipate and solve supply problems before they result in an adverse impact on the production line. This is an example both of improved supply chain (customer-supplier) integration and improved retail support by DLA to meet its customers’ requirements.

c. Wholesale and Retail Storage and Distribution Integration

At the 10 Navy and Air Force industrial depots where DLA assumed retail responsibilities, DLA’s local commanders are working with DLA’s Distribution Command to integrate DLA wholesale storage and distribution with retail storage and distribution requirements at each site. Three different models are at work.

At the Air Force ALCs, the local DLA Aviation Command commander is in charge. That commander is responsible for retail storage and distribution and coordinates with the local DLA Distribution wholesale warehouse. The local DLA Aviation commanders believe this is an excellent arrangement.

At the FRCs, the local DLA Distribution managers (wholesale) are in charge. DLA Distribution is therefore also responsible for managing the retail system, working in close coordination with the local DLA Aviation commanders. This arrangement has been met with mixed reactions by DLA Aviation’s local commanders.

This model is similar to the arrangement used at the shipyards—the local DLA Distribution Command manager is responsible for running both wholesale and retail storage and distribution. However, the local DLA Land and Maritime commanders are not

comfortable with this arrangement because they feel it does not allow them to be responsive enough to customer requirements.

Lessons learned from these three approaches will allow DLA to adopt the optimal organizational arrangements for each set of customers. Additional work remains on integrating the efforts and approaches of the buying commands, DLA Distribution, and J3 Logistics Operations at headquarters.

d. Retail Manual

The DLA Aviation Command is leading the development of a retail manual for DLA, designed to refine and institutionalize how DLA provides retail support to its military industrial customers. The goal is to develop and codify standard operating procedures for managing the retail distribution business for military industrial customers, thereby improving the effectiveness and efficiency of DLA's retail support and institutionalizing how DLA will perform this relatively new set of responsibilities.

e. Inventory Management

DLA continues to refine the technical and mathematical (operations research) underpinnings for its inventory management system. Working with its internal operations research group and outside experts (from RAND and the Logistics Management Institute, among others), DLA experts seek to make the inventory management system more efficient and responsive. Here it is important to distinguish between the technical capabilities associated with mathematical algorithms, risk assessment, and optimization schemes versus the actual selection of decision rules by senior executives, the ability of local DLA commanders to influence these rules on behalf of their customers, and the imperfections in data collection—including inaccuracies in demand forecasting and inadequate information on the costs of stockouts and prioritization of customer requirements.

f. Support to Deployed Forces

DLA received very high marks from Military Service and combatant command leaders for its support to deployed forces and contingency operations, particularly during the Afghanistan and Iraq conflicts. DLA was not only highly responsive to its in-theater customers when problems or challenges arose, but DLA took the initiative in many instances to anticipate problems and develop alternative and often innovative approaches. It did so by integrating small teams with existing theater commanders. DLA's performance with respect to the demilitarization and disposal of surplus equipment during the drawdowns in Iraq and Afghanistan is considered by many leaders to be an especially noteworthy success.

g. Support to Operating Forces

DLA is the wholesale supplier to the Military Services' operating forces, who manage their own retail distribution systems. DLA works with the operating forces to ensure that demand planning estimates (normally related to operating tempo) are as accurate as possible. At the same time, DLA attempts to maintain the ability to react quickly when Service requirements diverge from planned consumption levels, thereby depleting retail inventories. Mission capable and readiness data for non-deployed operating forces are generally high, and DLA-supplied parts are rarely the cause of significant readiness shortfalls.

h. Support to Military Service Industrial Customers

Although assessing DLA's performance in supplying military industrial facilities is more complex, neither DLA nor Service leaders see evidence of significant or systematic production shortfalls at the depots and shipyards due to parts shortages that DLA should be anticipating. Looked at from another perspective, the depots are meeting the readiness requirements of their own customers—the operating forces—and neither DLA nor other elements of the supply chain are interrupting the ability of the depots to meet their requirements.

More problematic for the depots appears to be the disruptions to their own planning assumptions caused by Service budget disruptions and unexpected shifts in demand from their operating forces. These reprogrammings and reprioritizations, including congressional actions such as sequestration, have an important effect on the “churn” (fluctuation) in demand experienced by the depots, and in turn on the demand for parts experienced by DLA.

Meeting the demands of its industrial partners requires significant efforts on the part of DLA and Service depot and shipyard personnel involved in workarounds to avoid serious production problems.³⁶ Unfortunately, the costs of these workarounds are not calculated by the Military Services or by DLA, including production delays, lost labor hours, expensive substitutes, and the salaries of the hundreds of DLA and Service employees at the depots and shipyards whose jobs include chasing parts and/or solving workarounds.³⁷ Consequently, the overall conclusion that DLA is successful in meeting

³⁶ A workaround might mean obtaining a part from an alternative source, cannibalizing the part, manufacturing the part in a depot's back shop, refurbishing an old part under the supervision of the appropriate engineers, or numerous other options. In fact, both DLA and depot personnel involved in “chasing parts” have formal checklists they use to solve the problem of a part that is not arriving on time.

³⁷ Conversations with the Air Force indicate that it has made some attempts to calculate these costs, but the measurement issues are very complex.

the needs of its industrial customers comes with an important caveat: at what price to DLA and its customers?

DLA customers recognize that unavoidable surprises are a fact of life. Consequently, one of their most important qualitative metrics is whether DLA is a responsive supplier—a supplier who works hard with the customer to anticipate problems and resolve them quickly. On the basis of this qualitative assessment, DLA does well in the eyes of nearly all the customers interviewed for this paper. There is, of course, a natural tendency to blame DLA when supply problems do arise. The causes of (e.g., unavoidable facts of life) and the responsibilities for addressing these supply problems are complex. They are not easily attributable simply to poor performance by DLA, or to imperfect planning on the part of DLA's customers.

i. Time to Award

Since early 2013 DLA has been conducting a major internal reform effort to reengineer those aspects of the contracting process that slow down the time to award. Lowering administrative lead times reduces backorders, reduces the age of backorders, and makes it possible for DLA to be more responsive to its customers, particularly when demand forecasts are inaccurate or the Military Services have sudden, unexpected needs. The Director of DLA led this reengineering effort personally, in part by chairing monthly reengineering team meetings. (It is one thing to say that something is a priority; it is another to make it a priority for everyone throughout a large and complex organization. The Time to Award reengineering effort seeks to do that.)

j. Standard Wholesale Metrics

Metrics such as material availability and backorders have been trending well during the last several years. The reasons for this improvement are to be found in the list of initiatives discussed earlier. As DLA and Service planners become more integrated, as retail support processes become more fully developed, and as time to award is reduced, the overall improvement in customer responsiveness should be reflected in high level metrics of DLA performance such as material availability and backorders.

However, such high level metrics provide only a partial view of how well DLA is meeting the requirements of its customers. A theme that will be returned to shortly is that DLA should be focusing more attention on how to improve retail customer support rather than being too heavily focused on high level metrics, whose primary insights are into the wholesale portion of DLA's business.

3. DLA's Retail Customer Focus Needs Further Improvement

As the above lists of projects and initiatives illustrate, DLA is engaged in numerous efforts to improve its customer focus. These efforts have resulted in many significant

improvements to DLA's business processes. It is important to recognize, however, that the push to improve customer focus, and especially retail customer focus, is relatively new—the result of BRAC 2005—and is still a work in progress.

Some of the changes that are underway are not yet institutionalized, and the continuation and permanent adoption of all these efforts is not yet guaranteed. In particular, the transition from a wholesale culture to an integrated wholesale-retail orientation is still a work in progress. The Aviation Command's efforts to develop a retail manual, and the integration of wholesale and retail storage and distribution at the military industrial facilities, provide examples of this challenge.

Additional changes or improvements that are needed—including some of those that are recommended in the next section of this paper—have either not begun or are in their infancy. For example, the Air Force is now able to generate 30-day and 90-day forecasts of parts deliveries or other actions (stockouts) that threaten to disrupt depot production schedules. Although DLA Aviation is adopting policies and practices to take advantage of these data, a more comprehensive, DLA-wide approach would allow DLA as a whole to be more responsive to Air Force requirements.

Finally, while there is intense attention at DLA paid to broad measures of material availability and backorders, a commensurate amount of attention is not focused on metrics more directly associated with DLA's retail customers—the progress with the Air Force and the Aviation Command notwithstanding. DLA has 17 main industrial customers in the four Military Services, of which 10 receive both wholesale and retail support from DLA. The IDA team found little evidence of the systematic, DLA-wide collection and use of data or metrics regarding the specific retail challenges faced by these 10 (or these 17) customers. In some cases there appears to be a reluctance to embrace retail operations or break away from the traditional DLA role of wholesale supply operations.

Sustained top management attention for the next several years will be required, particularly if the progress in moving DLA from a primarily wholesale orientation, to a holistic wholesale *and* retail orientation, is to continue and become institutionalized. The next chapter contains some specific recommendations on how a stronger retail and customer support focus might be built into DLA's operating procedures and culture.

4. DLA's Procurement of Depot Level Repairables (DLRs) is Progressing

Coming out of BRAC 2005 the Services and DLA developed a joint approach towards realigning the procurement and support functions of DLRs to DLA. DLA has implemented contracting cells at each of the Service Life Cycle Management Commands to coordinate the relationship with the Service item managers and engineering support, with the goal of reducing administrative lead times and time to award. Currently the transfer of requirements from Service item managers to DLA product specialists is a manual process.

This area needs improvement; DLA and the Services are working on an eProcurement approach.

C. Conclusions

The remainder of this paper suggests a number of areas in which DLA—and its Service customers—could improve their performance. None of the findings and recommendations leads to the conclusion that there are problems with DLA's core capabilities or flaws in its governance structure. Neither do they support the migration of any of DLA's current functions back to the Military Services or to other agencies. In fact, DLA's overall performance, and the policies that led to its current assignment of roles—e.g., consolidation to take advantage of economies of scale, its core capabilities, a strong IT/ERP backbone, a focus on costs—must be judged a success.

Work is still needed, however, to improve some management practices:

- DLA's efforts to focus on its customers, while achieving success, still require improvement, particularly in those areas that touch on DLA's retail responsibilities and its ongoing conversion from a wholesale organization to an integrated wholesale and retail organization.
- DLA's current focus on reducing lead times in contracting is critically important and must be continued. Shorter lead times make DLA more responsive, reduce costs to its customers, and mitigate the problems associated with (unavoidably) inaccurate demand forecasting and demand planning.
- The Military Services can help DLA provide better support by making some improvements of their own. Specific areas include technical data availability and database reliability, the effect of excessive Critical Application Item designations on DLA time to award efforts, and demand planning accuracy.

Recommendations in these and additional areas are provided in the next chapter.

4. Recommendations

A. Introduction

Interviews with senior leaders in the Military Services indicate an overall satisfaction with DLA's performance, its efforts to improve that performance, and its responsiveness to emerging customer requirements.

At the same time, however, DLA's adoption of the retail mission at military industrial facilities is still viewed as a work in progress. Many interviewees see work that remains to be done to continue improving DLA's retail customer focus, and some are concerned with whether the substantial progress to date will be fully institutionalized.

A number of important areas still require more attention. The recommendations for improvement fall under seven areas.

- 1. Supply Chain Integration.** DLA should continue building on its successes, and accelerate its integration into customer production planning processes.
- 2. Measuring DLA's Responsiveness to Its Customers.** DLA should adopt additional and more precise metrics to better support its retail customers.
- 3. Demand Planning.** The Military Services should work with DLA to improve their joint demand forecasting.
- 4. Time to Award.** DLA's reengineering effort should continue to receive a high priority; DLA and the Military Services both need to make improvements to certain internal management processes.
- 5. Depot Level Repairables (DLR).** DLA and the Military Services should conduct a business case analysis to assess whether the transfer of repair of repairables contracting from the Services to DLA would meet Service requirements and be cost effective.
- 6. Operational Integration.** The Military Services, the combatant commands, and OSD should institutionalize the lessons learned from recent contingency operations, especially with respect to planning.
- 7. Energy.** DOD should expand DLA's authority to contract directly for the maintenance and repair of fuel infrastructure.

B. Detailed Recommendations

1. Supply Chain Integration

DLA's support to its customers traditionally has been provided at the wholesale level. Operating forces, deployed and non-deployed, and other customers have their own retail operations that are dependent on effective and efficient DLA wholesale support. This includes everything from Class IX repair parts for major weapons systems to food, clothing, medical, and other supplies for personnel and the entire DOD establishment.

At some Service industrial facilities (depots), however, DLA now has direct responsibility for both wholesale and retail distribution. The retail portion of this mission is relatively new, having been assigned to DLA during the BRAC 2005 process. Since then, some of DLA's greatest progress in supporting its military industrial customers has occurred where DLA and its customers have agreed that DLA must be a partner that is more fully integrated into the depots' production planning processes. The actual degree of integration varies at each site. Different approaches are employed for partnering with each industrial customer: the Air Force ALCs, the Navy FRCs, the Navy shipyards, and the Army and Marine Corps depots.

a. BRAC 2005 and the Significance of Retail Responsibility

The idea that DLA's responsibilities would be expanded to include retail as well as wholesale inventories was an important BRAC 2005 decision. However, it was also a source of great concern for the Military Services. The Services were accustomed to ordering parts from DLA—their wholesaler—and then owning all those purchased parts themselves. The Services made their own decisions about how to manage their retail businesses, including how much to order and when, and how much inventory to stock in each location. Additionally, they were accustomed to having physical control over all parts and other items at each of their depots. Because all those items in the local retail store were locally owned and controlled, the parts were guaranteed to be available for that depot. One could even say that they were “fenced”—the sharing or cross-leveling of stocks between locations could not be forced on each depot, because they each owned their parts.

The concept of operation promoted by the BRAC 2005 decisions was different. DLA would (1) take the projected demands from all the depots and operating forces in all the Military Services, (2) determine DOD-wide optimal stocking levels, placement, and economic order quantities for each, and (3) deliver the parts as needed at the retail level to each individual depot. It would own the retail stores and everything in them. The expectation was that total DOD inventories and costs would decrease, as each industrial depot would need to maintain lower local stock levels of common items, and DLA could order, manage, and deliver parts more efficiently from one or a small number of large and centralized wholesale warehouses.

The transfer of retail responsibilities from the Military Service depots to DLA had an additional benefit. To perform the retail mission successfully, DLA and its depot customers need to work much more closely with one another. The BRAC decision caused DLA and its industrial customers in the Air Force and the Navy to adopt practices which would cause DLA to be much more integrated into the production planning processes of its customers. *This integration of DLA into the production planning processes of its customers is one of the most powerful changes taking place in the DOD industrial supply chain.* It is an important step towards the goal of full supply chain integration.

The Navy FRCs, the Air Force ALCs, and the Navy shipyards are learning to share their production planning information with DLA in as timely and seamless a fashion as possible. DLA, for its part, is learning how to participate in those customer planning processes, use customer data more effectively, and share supply information with its customers. This is an ongoing process of adaptation on both sides as they learn the benefits of and the requirements for improved supply chain integration.

A good example of how this works, what the benefits are, and what remains to be done, may be found in the relationship between DLA Aviation and the Air Logistics Complexes. The Air Force began several years ago to reengineer the production processes at its three ALCs. This reengineering has been successful. The ALC production processes are more efficient, production quality has improved, and costs have dropped. One element of the reengineering process has been to analyze all the critical paths in the production process, and to redesign those production processes so as to systematically identify and remove obstacles to quality and efficiency.³⁸ Among the measures of the Air Force's success has been its ability to reduce the time required to perform Programmed Depot Maintenance (PDM) on major weapon systems.³⁹ For example, the days required to perform PDM on the KC-135 aircraft have decreased from 197 days in FY 2010 to 126 days in FY 2014.

In 2011 DLA increased its emphasis on improving direct retail support to its Air Force and Navy customers. This meant, among other things that DLA local commanders and their organizations developed better collaboration tools and processes with their local customers; i.e., they became increasingly integrated into the production planning processes

³⁸ These observations are based on visits to the ALCs and interviews with Lt Gen Bruce Litchfield, the commander of the Air Force Sustainment Center (AFSC), which operates the depots; interviews and conversations with other members of the AFSC leadership team and officials at Air Force Materiel Command (AFMC), of which AFSC is a part; and interviews and discussions with DLA officials at the DLA Aviation Command and elsewhere who work with the Air Force depots.

³⁹ Aircraft come to the depot for a major maintenance overhaul on a regular schedule. The KC-135 fleet, for example, is on a schedule that brings every aircraft through the depot once every five years. That is roughly 76 aircraft per year for the fleet of 381 KC-135s.

of their customers so as to understand and anticipate their precise, upcoming requirements. Instead of DLA continuing to view retail as “wholesale done faster and smaller,” the DLA buying commands began developing retail-specific tools and practices.

In the case of the ALCs, the Air Force and DLA Aviation now employ a forward looking set of metrics, prepared by each ALC, that anticipate potential critical path problems in the ALC production lines. (These metrics are discussed in the next section.) DLA Aviation Command’s retail relationship with the ALCs consists of knowing what the customer knows about their production plans when the customer knows it; anticipating parts requirements and planning their deliveries so as to ensure on-time delivery; and solving problems by developing workarounds with customers when a part does show up on the ALC metrics as likely to have an adverse impact (as likely to cause a delay or other problem) on the depot’s production line. Again, these are important elements for achieving improved supply chain integration.

The Army and Marine Corps continue to purchase from DLA wholesale and then manage their own retail inventories. Consequently, the relationships of DLA’s local commanders with the Army and Marine Corps depots are, as would be expected, much less intimate than their counterparts’ relationships with the Air Force and Navy aviation depots. Instead of having a colonel/captain (O-6) or lieutenant colonel/commander (O-5) leading a local organization of several hundred people, DLA has a handful of lower level officials (four to five people) at each Army and Marine Corps depot, acting as liaisons between the depots and the buying commands. There is not the same highly collaborative and extensive local working relationship in which senior DLA managers and experts are well integrated into the production planning processes of their customers. This is the case at the aviation depot at Corpus Christi, which is supported by DLA’s Aviation buying command, as well as at the other Army and Marine Corps depots, which are supported by DLA Land and Maritime.

The Navy shipyards present an intermediate case. DLA handles the buying functions for the retail stores at the shipyards, but it uses Navy funds, and the Navy makes many of the decisions on what to buy. The Navy thus owns the items at the retail level. Part of the explanation for this is that many items are ordered in very small quantities (often one or two units of an item, which is common with ships), so a significant portion of retail is destined to a specific job—a specific maintenance or repair action on a specific ship or system.

b. Enterprise Resource Planning

DLA has a successful ERP system that, among other things, enables increased performance and efficiencies associated with supply chain integration. The Enterprise Business System, or EBS, forms the backbone of DLA’s business operations, and its

capabilities have enabled DLA's success in meeting many of the responsibilities and challenges it has been given, including asset visibility, inventory management, financial controls, and contract automation. However, the evolution towards greater supply chain integration with retail level customers has exposed three challenges with EBS.

DLA is one of the few organizations in the Defense Department that has successfully developed and fully implemented an ERP system. Throughout the Department during the past two decades, multi-billion dollar ERPs have either failed completely, or still have very limited functionality. This means that as DLA works towards greater supply chain integration with its customers, there are limitations on what can be accomplished in terms of the potential integration of the IT/ERP systems of DLA and its Military Service customers.

Even if DLA's customers in the Military Services were to have fully functioning ERPs, however, it is a matter of debate as to how well their systems could be integrated effectively with DLA's ERP. The Service industrial depots do not function in a vacuum. They are components of much larger and even more complex organizations. Army depots, for example, have as customers a large and diverse set of Army operating units, which themselves are part of a much larger and complex organization—the U.S. Army. An Army ERP, or ERPs, for many perfectly good reasons, may be configured differently than Air Force or Navy (or Naval Air Systems Command or Naval Sea Systems Command) ERPs. And all of them would look different from an ERP for DLA whose logistics business is less complex from a data variety perspective than are the multi-faceted businesses of the Services.

The third challenge facing DLA with respect to its ERP system is that it was designed based on DLA's responsibilities as the wholesale provider of parts and materiel to the Military Services. The BRAC decision in 2005 expanded DLA's scope of responsibilities into retail business areas. Part of the difficulty DLA had in first taking on retail responsibilities was in assuming that the wholesale machine, including EBS, could, with a few adjustments, provide the same quality of support to the retail mission as it did to the wholesale mission. The problem, though, was that retail is not “wholesale done faster and smaller,” as more than one senior executive at DLA, and elsewhere, pointed out in interview sessions. It requires a different, although complementary, set of business practices. The evolution of EBS to support both wholesale and retail functionality has been a challenge, and continues to be a work in progress.

Although DLA is a well-structured organization, and its performance at the retail level has improved considerably since it began in 2008, one of its remaining challenges is to fully implement management policies and processes that provide appropriate weight to both its wholesale and its retail responsibilities—to recognize the importance of, the distinctions between, and the balance required of these two business models.

One explanation for the slow pace of adaptation and development of retail tools and functionality in EBS, offered by several interviewees, is that the DLA line (field) organizations do not understand the full capabilities resident in EBS, while at the same time the headquarters staffs are still learning to understand the complete needs of the retail activities. Because of the importance of maintaining standardized systems and processes, most work on EBS must be coordinated and performed out of the headquarters J6 Information Operations.

Managers at all levels understand that the resources of J6 Information Operations are limited, and that the priorities currently being given to promoting audit readiness (the top priority for EBS improvements) and reducing time to award (the second priority established for EBS) leave few resources for other needs.⁴⁰ Nonetheless, there is a general frustration with this “crowding out” effect, as some managers believe that additional resources need to be devoted to other important priorities related to supporting retail customer requirements.

Finding 1A: DLA has had increasing success in building supply chain integration into its work with its retail customers. This success is likely to continue as DLA extends and accelerates such efforts.

Recommendation 1A: DLA should work with its Military Service partners to accelerate plans for expanding supply chain integration with their customers’ planning processes.

Finding 1B: DLA’s Enterprise Resource Planning (ERP) tool, the Enterprise Business System (EBS), is an essential backbone for much of DLA’s capabilities.

Recommendation 1B: DLA and the Military Services should explore how to better integrate and leverage DLA’s Enterprise Business System and the Services’ logistics IT systems, in order to achieve tighter supply chain integration.

Finding 1C: The priority that line managers place on developing improved retail capabilities is not adequately reflected in headquarters staff efforts to modify and improve EBS tools and functionality.

⁴⁰ All DOD components are required to become audit ready by FY 2017. This is a major policy goal set by the Secretary of Defense and Congress, and embraced by the Director of DLA. The resources required to accomplish audit readiness are substantial; consequentially, much of the investment in changes to EBS are directed towards this goal as the top priority.

Recommendation 1C: DLA should make improvements to retail tools and functionality a higher priority in the development and refinement of EBS capabilities.

Finding 1D: The Army and Marine Corps continue to be responsible for their own retail operations at their industrial depots. They and DOD would likely gain more efficiencies if these retail functions were conducted by DLA.

Recommendation 1D: OSD and DLA should work with the Army and Marine Corps to conduct business case analyses on the transfer of retail responsibilities at their industrial depots to DLA.

2. Measuring DLA's Responsiveness to Its Customers

a. Traditional Performance Metrics

DLA is a very data driven organization, with a strong understanding of numerous and important wholesale measures. It carefully tracks material availability, backorders, aged backorders, purchase requests, order response times, and numerous other indicators of its performance.

However, data on precisely how DLA is meeting, or is likely to meet, its individual customers' requirements for specific parts that are mission critical or on a critical path are less well developed. If, for example, material availability is 90 percent, it would be useful to have precise information on which of the remaining 10 percent are time critical to which customers, and what the consequences would be if those parts are not received on time; i.e., to be able to identify those parts that are, in the future, going to cause the most harmful disruptions in time and/or cost to depot production lines or operational readiness.

Materiel availability and backorder metrics are of little value to a mechanic, artisan, or depot manager if the specific parts they need to perform specific tasks are not available. While valuable in many respects, they do not provide a *prospective* view of the most critical parts an industrial depot or shipyard needs in the days, weeks, or months ahead in order to avoid a potentially costly workaround. In addition, there appear to be no measures of the impact, including the costs to the customers, of unmet customer demands, including the number, types, and costs of workarounds and production delays.

b. Performance Metrics That Are Prospective

Examples of metrics that take a prospective look have been discussed above. The Air Forces' successful reengineering of its ALCs now includes a forward looking set of metrics that anticipate potential critical path disruptions in the ALC production lines. The Air Force approach is to manage to "Gates" in the production process—to identify and eliminate the impediments to accomplishing, on a set schedule, the discrete tasks on the critical path that

allow an aircraft to move on to the next set of production (maintenance and repair) tasks. Every month each ALC looks forward 30 and 90 days in an effort to identify those Gates that are at risk of not being met. This may be because there is a risk that a DLA-supplied part may not be available on time, or because of some other potential problem in the production process—e.g., a maintenance problem on the production line, or problems with other suppliers, such as the Air Force itself or the Air Force’s industry partners.

These metrics are presented in “Stoplight” charts. An example is provided in Figure 4. In the upper right-hand quadrant of this chart are data on how many parts are projected to be missing 90 days out. The red ovals indicate parts that are expected not to arrive on time. They signify a “gate-busting” condition—a likely or potential work stoppage. These conditions get immediate attention and become the highest priority for Air Force and DLA personnel. In this example, there is one DLA part that falls into that category. The yellow ovals indicate parts that are likely not to arrive on time, but for which there is still time to find a workaround—e.g., a part from another source, a cannibalized part from another airframe, or a remanufactured part made in the depot machine shop. In this example, the Air Force itself has 163 parts in this category and DLA has 457 parts. The data in the lower left quadrant show comparable data looking 30 days out.

This data is shared in full by the ALCs with their DLA counterparts so as to ensure that DLA knows what the Air Force knows as soon as possible, and to enable the two organizations to work together on addressing potential problems.⁴¹ This information is critical to each of the local DLA commanders and the DLA Aviation supply chain. In the absence of perfect information and performance—perfect demand forecasting and 100 percent material availability—this is precisely the kind of information sharing and integrated planning one would expect to see between a large supplier and a complex customer.

All depots in all the Military Services conduct extensive planning, and all depots are therefore able to anticipate, to some degree, potential parts shortages in the near future. What sets the AFSC approach apart is how rigorously and systematically the data can now be provided, and how far out they can see with a fair degree of accuracy. The result is that the Air Force has become a better customer, and DLA has been able to use the better Air Force data to become a better supplier.

⁴¹ For example, the DLA Aviation Command leadership participates in weekly video teleconferences held by the three-star Commander of the Air Force Sustainment Center (again, the command that owns the three Air Force depots) where this and other data and issues are reviewed with all the relevant actors in the Air Force maintenance community.

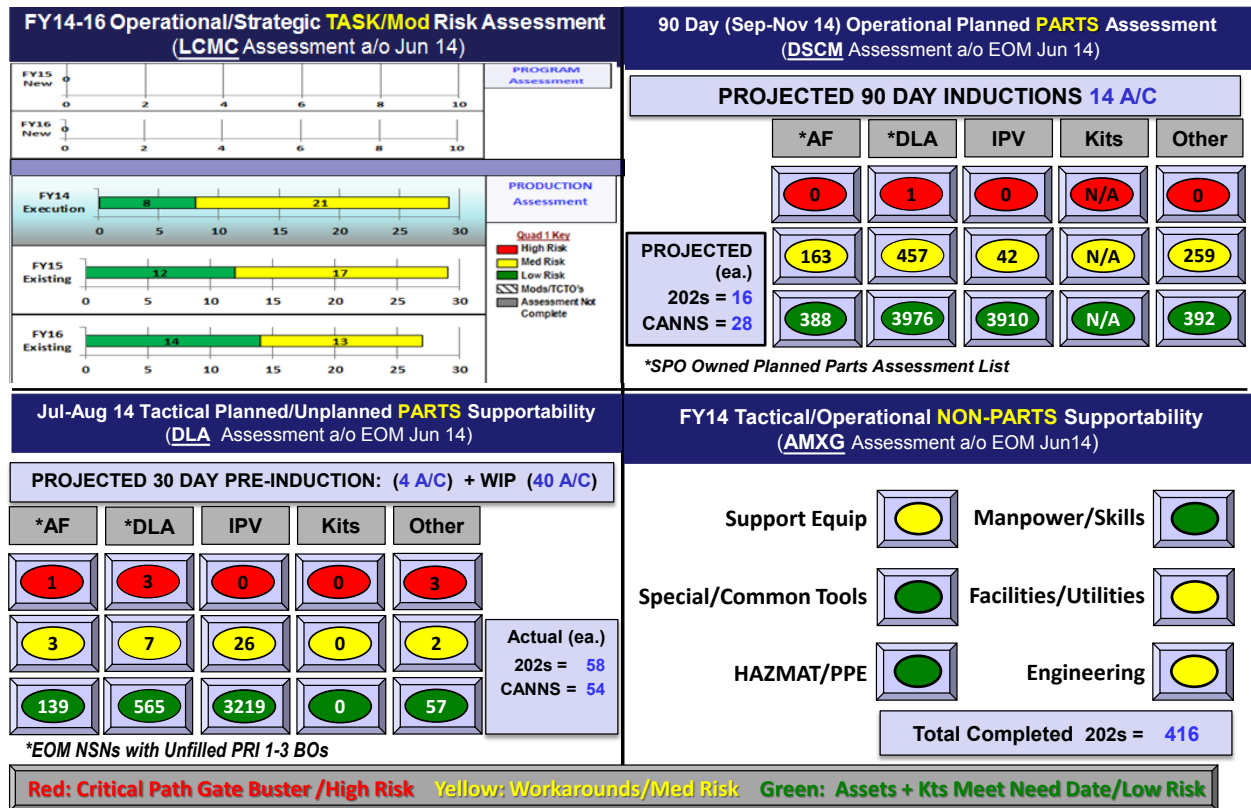


Figure 4. ALC Stoplight Chart: 30- and 90-Day Prospective Looks

In addition to its traditional wholesale and backwards-looking metrics (e.g., material availability, backorders), DLA and its industrial customers need to focus additional attention on developing specific retail-oriented data coming from each of its 17 industrial customers.

c. The Cost of Workarounds

The cost of not having parts when they are needed can be considerable. Although it is rare for a production line stoppage to occur, there are significant second and third order effects. Unfortunately, there are no measures available of the resulting costs. The categories of costs that are involved are clear enough to see, however, and in some cases one can see their potential magnitude.

From the DLA side, the costs of not having parts when they are required fall into two categories: staff hours and inefficient buying. When a depot and DLA realize that a part will not, or may not, arrive on time, they seek either another source for that part or a substitute. The local DLA Aviation commanders at the Oklahoma City, Hill (Utah), and Warner Robins ALCs estimate that their Customer Support Groups spend approximately 40 percent of their time “chasing parts.” While solving problems is a normal and integral part of any logistics system—the cost of workarounds is rarely zero—Oklahoma City has

126 people in its Customer Support Group, and Warner Robins has 80 people. This is an example of the costs and complexity involved in performing enterprise-wide optimization for DOD's supply and maintenance systems.

When a part is on the Air Force's 30- or 90-day list of items that will not, or may not, arrive in time, DLA employees, in collaboration with their customers, work off a checklist of potential workarounds to solve the problem. A similar process is at work in all the Navy, Army, and Marine Corps depots. Workarounds include the following:

- The same or a similar part may be found from another vendor.
- If the parts are on order the delivery might be accelerated.
- The depot machine shop may be able to repair an existing part, manufacture a new one, or receive a waiver of some kind from the engineers responsible for the design and technical data.
- The item may need to be cannibalized from another system.
- A substitute item may be serviceable, but would need to be replaced sooner than a new part.

The workarounds for missing parts also involve the time of a considerable number of Service personnel at the depots.

An additional cost to the customer occurs when the production line has to be slowed down or altered in any way. Work may have begun on a repair, only to be halted by the lack of a part. Once the part arrives, the repair work can continue, but there may have been some delay and/or rework required.

Unfortunately, the dollar costs associated with workarounds are not measured. The Military Services understand this issue, but the measurement challenges are difficult to overcome. If they could measure these workaround costs, DLA might find that the costs are high relative to the costs of improving information systems and collaboration processes that would allow DLA to improve its ability to be more responsive to its customers' needs.

Finding 2A: DLA and the Military Services do not have adequate measures of the prospective shortfalls of parts at the industrial depots.

Recommendation 2A: DLA and its Service partners at the 17 primary industrial facilities should develop additional metrics that provide a prospective look at how successfully DLA is likely to meet critical upcoming customer requirements.

Finding 2B: DLA and the Military Services do not have adequate measure of the costs of workarounds.

Recommendation 2B: DLA and its Service partners at the industrial facilities should develop measures that would provide better insights into the costs of late or missing parts to production operations.

3. Demand Planning

Demand planning for DLA's military industrial customers is based on a complex set of factors. Demand planners at each of the Service depots need to know which weapon systems are coming in, on what schedule, and for precisely which maintenance and repair actions. There are numerous variables at play here, including changes in operational needs, changes in budgets, and incomplete information on the maintenance needs of each individual vehicle or system coming to the depot—e.g., an armored vehicle coming back from a summer in Iraq will have different issues than a vehicle coming back from a winter in Afghanistan, not to mention the unique battle damage each may have suffered. The unexpected changes (churn) in demand for depot work due to such changes represent an important aspect of the demand planning challenge. This is important to bear in mind when considering the demand planning (forecasting) challenge faced by the Service depots.

Once the depot planners establish their production schedules, they then need to determine what the parts list is for each maintenance job to be done. This is typically known as the Bill of Material, or the BOM.⁴² All of this is used to develop, in collaboration with DLA, a forecast of the parts that will be needed for the planned maintenance actions. DLA then uses these forecasts to inform its buying and stocking (inventory management) decisions.

It is important to recall that DLA uses two basic methods for demand planning: projections based off of historical demand patterns (all the data for which is maintained in EBS), and forecasts based on collaboration with the customer's demand forecast. In the latter case, however, DLA does not automatically buy whatever the Military Services forecast. A judgment call often has to be made about how to balance the historically based forecast against the contemporary Service demand forecast. This is because the Service demand forecasts are frequently inaccurate—again, due to facts of life, not bad forecasting.

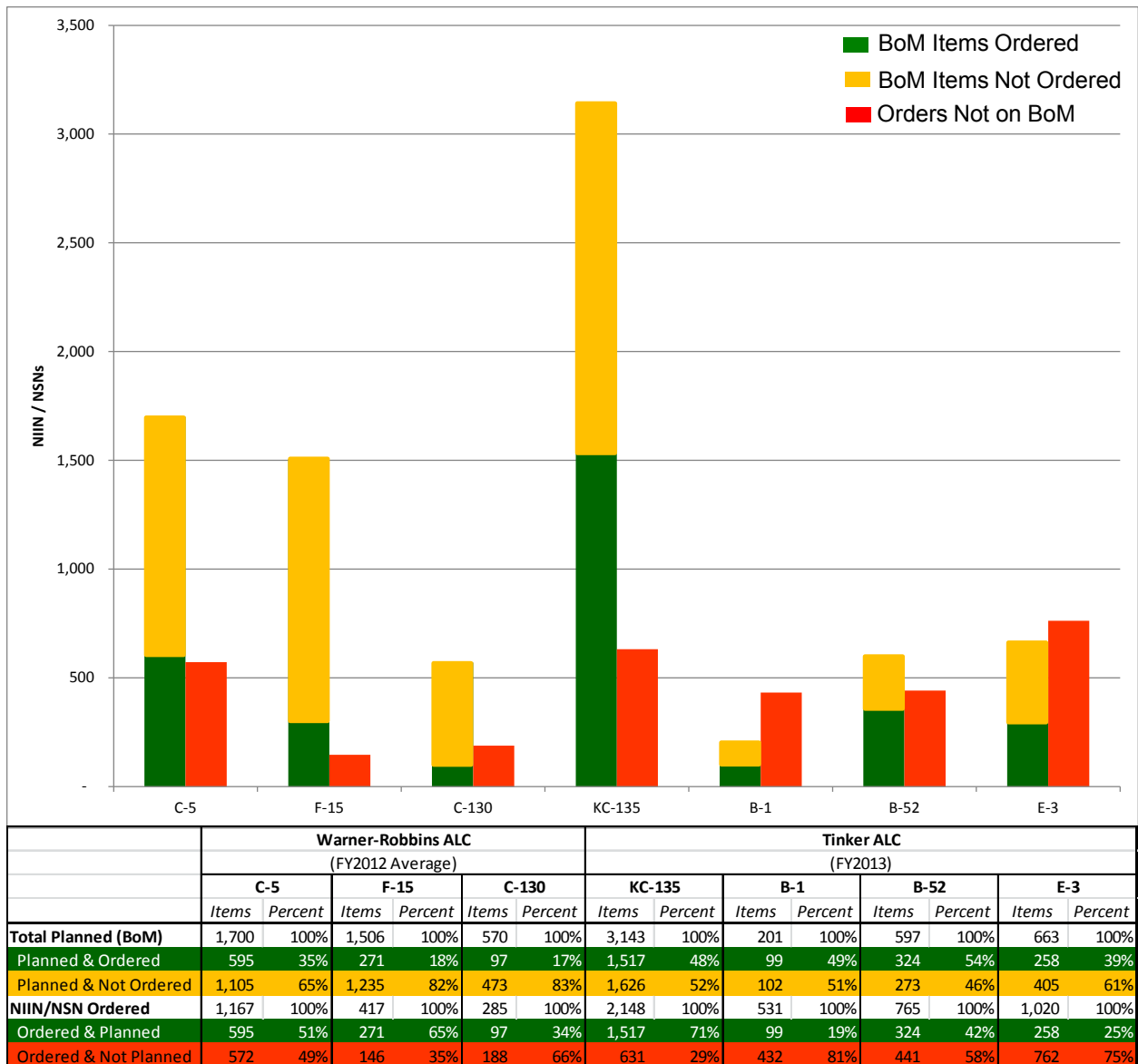
⁴² The BOM being referred to here is not the parts list for the entire system or subsystem. Rather it is the subset needed to complete a specific maintenance operation. If 100 distinct national stock numbers (NSNs) are needed for a repair action, out of a total of 1,000 NSNs that appear in the (sub-)system, then the BOM—sometimes called the Maintenance BOM—will list those 100 parts.

a. Demand Forecast Accuracy

Obviously, the more accurate the Service demand plan, the more accurate the supply chain can be. If the Service overestimates its needs, the result may be that DLA orders too many units of an item, which would result in excess inventory. If the Service underestimates its needs, the result may be that DLA orders too few of an item. This may result in backorders and workarounds at the depot if new parts cannot be ordered in time to meet the depot's production schedule.

Figure 5 provides an example of how difficult demand forecasting can be.⁴³ It shows data on several Air Force systems maintained at the Warner Robins and Tinker ALCs. What is being measured here is the number of unique items—the number of unique NSNs—and not the number of units being forecast for each NSN. Thus, for example, the Air Force forecasted that it would need 1,700 distinct NSNs during FY 2012 for planned C-5 maintenance actions. In some cases the forecast might be for one unit of a particular NSN, and in other cases the demand might be for multiple units of a particular NSN. But here we are only concerned with the binary case of whether, based on the Maintenance BOM, an NSN was forecasted to be needed in any quantity, and then whether the actual, resulting demand was zero or greater than zero.

⁴³ The purpose of this example is not to suggest that the Air Force is different or has more problems than the other Services. The data in this example illustrate a systemic challenge found in all the Services.



Source: DLA Aviation Command.

Figure 5. An Example of Maintenance Bill of Material (BOM) Accuracy

In the end, actual demand from this list was only the green bar—595 NSNs in the case of the C-5. That means that for the C-5, 35 percent of the 1,700 NSNs on the Maintenance BOM had at least one unit demanded, but 65 percent of the NSNs on the BOM (the yellow bar) ended up with zero demands. If DLA had bought all those NSNs in the yellow bar, then there would be the potential for substantial excess inventory. To make matters worse, the red bar shows additional, actual demand that was never planned or forecasted in the BOM. If DLA did not buy these NSNs—572 in the case of the C-5—many could end up

on backorder. Total revealed demand was 1,167 items—595 (green bar) that were on the BOM plus 572 (red bar) that were not on the BOM.⁴⁴

Why does all this happen? The perturbations caused by changes in operational demands and budgets, including reprogrammings and budget sequestration, are facts of life in all depots in all the Military Services. In addition, the weapon system inventories of all the Services are aging, and aging systems bring with them maintenance surprises; they require inspection and evaluation during the maintenance process to determine what parts are required, which is not an easy pattern to forecast. There are additional reasons for inexact demand planning, but significant gains could be achieved if the Services were able to improve the accuracy of their BOMs.

Finally, the costs of demand planning inaccuracies are not being directly measured. When a BOM is shown, after the fact, to have been less than 50 percent accurate, DLA and its customers should be able to track the impact this forecast had on subsequent excess inventory, backorders, and workarounds. The costs of these inaccuracies or imperfections could be measured so that the value of cost-effective corrective actions might be developed.

Finding 3A: More accurate Maintenance Bills of Material lead to more accurate demand planning, and BOM accuracy is a problem.

Recommendation 3A: OSD and DLA should work with the Services to invest more effort in maintaining accurate BOMs.

Finding 3B: There is insufficient information regarding the costs of inaccurate demand planning.

Recommendation 3B: DLA and its Service partners should develop more precise measures of the amount of excess inventory and numbers of backorders that result from inaccurate demand planning.

4. Time to Award

The decision-making processes that lead up to the award of a contract are carefully prescribed in policy, and the steps required are embedded as standardized business practices in EBS. Although the majority of contract awards are fully automated, a significant number of contracts (approximately 20 percent) still require some manual intervention. In spite of the high level of automation being achieved in DLA's supply

⁴⁴ Looking at actual order quantities (units)—revealed demand—for each NSN, a separate analysis by DLA of KC-135 data for FY2013 shows that only 8 percent of the items on the BOM were ordered in quantities within plus or minus 25 percent of the forecasted quantities.

management process, there is still an opportunity for a significant reduction in the time it takes to award contracts. This is important because lowering administrative lead times allows DLA to be more responsive to customer requirements when, for example, demand surprises occur or demand forecasts are inaccurate and workarounds are suddenly required. More generally, it allows for more efficient supply operations; e.g., lowering inventories and backorder times.

Another important challenge is to ensure that the authorities within the DLA contracting offices are well understood, so that, for example, actions are not delayed while waiting for unnecessary approvals. Other DLA initiatives address delays that occur as a result of “no-quotes” or other problems in getting vendors to bid or to contract efficiently for work. These and numerous other changes require careful attention by DLA, especially the buying commands, to the detailed “blocking and tackling” of getting work done efficiently.

Although DLA bears a large part of the responsibility for continuously improving its supply management and procurement processes so as to reduce the administrative lead time for contracting, its customers in the Military Services also bear some responsibility for improving the DLA-ESA (engineering support activity) business model. DLA, OSD, and the Services need to focus attention on two important areas so that the Services can become better customers and, in turn, receive better support from DLA.

- The Military Services’ classification of repair parts as Critical Application Items (CAIs) is excessive.
- The process for ensuring that DLA has access to up-to-date technical data on consumable items is inadequate.

The following observations are supported not only by the research in this study, but by three other studies that IDA performed for DLA over the past several years.⁴⁵

a. Critical Application Items (CAIs)

The Military Services have designated a major subset of the consumable items that DLA manages as Critical Application Items, a designation primarily reserved for weapon system repair parts. There are approximately 1.2 million CAIs, or roughly half of all DLA managed weapon system consumable items. The over-classification of critical application items is a large contributor to the overall delay in the engineering process.⁴⁶ As DLA

⁴⁵ Kenneth Evans et al., *Analysis of the Joint Engineering Support System and Its Contribution to the DoD Supply Chain*, IDA P-4202, May 2007; Evans, *Improving the Management of Critical Application Items (CAIs)*, IDA D-4217, April 2011; and Evans et al., “Improving Aviation Engineering’s Support to the DoD Supply Chain,” draft (not yet released).

⁴⁶ A separate designation, Critical Safety Items, does seem to be managed well.

struggles to satisfy the various requirements associated with CAIs, the time to award increases and DOD supply chain performance decreases.

b. Updating of Technical Characteristics

The Military Services are the custodians of the technical data associated with their weapon systems; they are responsible for configuration management of all the components that comprise those weapon systems. DLA, when procuring weapon system repair parts, requires access to the Services' current technical data that characterize those items. However, the process to validate or update an item's technical description too often delays the procurement of needed items.

The problem is that the Military Services do not consistently validate that their configuration management databases are current. As a consequence, even though DLA has access to these databases, it must seek prior approval, on a case-by-case basis, from the responsible engineering support activity (ESA) in the relevant Service. Typically the answer is yes, but this answer comes after a process—the filing of a Form 339—that on average adds 100 days to DLA's time to award.⁴⁷

An important aspect of resolving this issue is for the Military Services to “push” changes in technical data as they occur and grant DLA permission to use that data without requesting prior approval. DLA would then be able to rely on this data as accurate and up-to-date.

Finally, the payments made by DLA to the ESAs for the processing of the Form 339s are estimated at approximately \$40 million per year. Since the Services are required to maintain technical data as part of their configuration management responsibility, it is not at all clear why DLA must pay for this information. This system, as it currently functions, is not sufficiently responsive to the needs of the operational forces and the maintenance depots.

Finding 4A: DLA's administrative lead times are too long. DLA leaders know this and have a major reengineering effort underway to improve performance.

Recommendation 4A: DLA efforts to reengineer its internal contracting processes should be continued as a high priority.

⁴⁷ Both DLA and IDA (in a separate set of research projects) estimate that the ESA portion of the “339 process” adds approximately 46 days to lead times. But IDA further estimates that DLA's internal delays in getting 339s out, and then delays in taking them up when they get back, add another approximately 54 days to the total. See Evans et al., *Analysis of the Joint Engineering Support System*.

- Finding 4B: Among the many opportunities for improvement in the Time to Award reengineering effort, one that needs to be revised is the CAI (Critical Application Item) process.
- Recommendation 4B: DLA should do a better job of recognizing inappropriate or unnecessary CAI designations, as well as inefficient internal DLA processes for handling CAI designations. At the same time, OSD should direct the Services, with help from DLA, to review and revalidate their CAI designations.**
- Finding 4C: Service processes for technical data configuration control and communication of updates result in unnecessary delays in DLA's contracting lead times.
- Recommendation 4C: The Services must improve their ability to "push" (make readily available) reliable technical data, including access to changes as they occur.**
- Finding 4D: The Service engineering support activities (ESAs) are Service organizations that support Service requirements. DLA payments to the ESAs create inappropriate incentives and perpetuate inefficient processes.
- Recommendation 4D: The practice of DLA funding for ESA activities should be ended.**

5. Depot Level Repairables (DLRs)

Service Program Managers (and their engineers), Service Item Managers, and Service and DLA Buyers have distinct functions. For the repair of repairables, the Service Item Manager sets requirements and also makes the decision to use either organic (Service) or contractor repair. These decisions are based in part on workload balancing requirements in the depots. The Service Item Manager then communicates the requirement for sending repairs to a contractor to the Service Buyer, and the Service Buyer works with his or her contracting officer to prepare the contract. If it is a buy of new DLRs, on the other hand, the Service Item Manager tells DLA (not the Service) Buyer what to buy.

Since there has to be a handoff from an Item Manager to a Buyer, it should make no difference who takes the final contracting action taken—a Service or a DLA buyer—when contracting for new DLRs or for the repair of DLRs (the repair of repairables). The issue here is who should do the *contracting*. All maintenance responsibilities, including the setting of requirements for repairables, are Service responsibilities.

The potential advantages of a DOD policy to consolidate contracting for the repair of reparable and new DLR buying in DLA are the same as they have been since BRAC 2005 was implemented. There may be economies of scale to be gained by reducing the number of contracts,⁴⁸ along with the presumed negotiating advantage of DLA and DOD providing a single face to the supplier.⁴⁹

The potential disadvantages of such a policy change are twofold. First, some in the Services lack confidence that DLA will buy exactly what is required by the Service.⁵⁰ Second, some in the Services believe that such a change would encourage DLA and OSD to attempt to take over responsibility for actual maintenance operations; i.e., in this view, letting DLA contract for the repair of reparable is a slippery slope that must be avoided. Setting forth implementation guidance that acknowledges and addresses these potential disadvantages may lessen the Services' concerns.

Finding 5: Repair of reparable contracting is distinct from item management; both DLA and Service contracting organizations have the requisite ability to contract for the repair of reparable.

Recommendation 5: OSD, DLA, and the Services should conduct a business case analysis to evaluate the costs and benefits of transferring repair of reparable contracting from the Services to DLA.

6. Operational Integration

Combat operations in Iraq and Afghanistan constituted an important shift in DLA's traditional boundaries vis-à-vis the Services. In both conflict areas, DLA was called upon to support deployed troops not only by shipping sustainment supplies from the United States to the theater of operations, but also by consolidating supplies as they arrived in the theater and then sending them forward to customers in the field. The Military Services were uniformly complimentary toward the level of support they received as a result of this extension of DLA's activities beyond its traditional boundaries.

DLA's activities in support of combat logistics reflect significant institutional learning and have yielded a new competency: embedding and empowering carefully

⁴⁸ Reducing the number of contracts has no bearing on the questions of where work is done (military depots or industry) and who makes those decisions.

⁴⁹ Once again the question of where the economies of scale are, and which DOD actors are in the best position in any given situation to take advantage of being the "single face to the supplier," must be carefully considered in any analysis of this issue.

⁵⁰ This assertion came up repeatedly in interviews with Service officials.

chosen DLA forward elements, who work as a team with deployed forces, from the Combatant Commander to the Forward Operating Base. DLA's actions have greatly enhanced logistics support to deployed forces.

In some cases, DLA's new competency emerged despite organizational and procedural obstacles, which also deserve the Department's attention as it looks to the future. A former DLA Support Team Commander serving in Iraq as late as 2009 recalled that:

The fact that DLA personnel were not part of Time-Phased Force Deployment Lists and other important deployment-related data tables, models, planning cycles, etc., led to some brute-force solutions. Example: I was present in the Logistics office area, but I didn't really belong on anyone's staff or report to any deployed commander. Getting in and out of country or moving around in country was challenging at times because no one knew we really existed. We made it work, but it should be cleaned up.⁵¹

This example illustrates one of the clearest lessons of recent conflicts: the sooner DLA and other logisticians are brought into the planning process, the more effectively and efficiently they can meet the requirements of deployed forces. Further, DLA's lessons learned on how to support deployed forces will atrophy if they are not codified into doctrine, supported by the development and use of appropriate metrics, and exercised regularly. Therefore, the Department would be well served by (1) updating its doctrine, organization, training, and planning in order to foster this new competency; and (2) ensuring that DLA personnel in theater and at the combatant commands are fully integrated into staffs and operations.

Finding 6: Hard-won logistics lessons learned from the conflicts of the past decade, including the evolving role played by DLA, will be lost if not incorporated into doctrine.

Recommendation 6: DLA should work with its Service customers to incorporate into doctrine some of DLA's lessons learned and innovative practices, and institutionalize DLA's role within Combatant Commander and Service-owned activities and processes, such as conducting joint exercises and assessing performance.

7. Energy

Service customers generally report high levels of satisfaction with DLA Energy performance in its core functions of contracting for, purchasing, transporting, storing, and

⁵¹ Communication to the authors from Colonel Dan Hicks, Commander, DLA Aviation, Warner Robins ALC.

conducting quality assurance on bulk petroleum products. DLA Energy's supply of fuel to both expeditionary forces and to fixed installations receives praise for its timeliness and efficiency. Additionally, Energy liaison staff members at combatant commands and at operating headquarters have been providing strong support to operational planning and execution.

The current Energy initiatives have the potential to produce significant improvements in the cost-effectiveness of DOD fuel operations and infrastructure.

- When fully implemented, it is estimated that conversion to Jet A aviation fuel for CONUS-based forces will provide between \$25 million and \$40 million in savings per year in product costs.⁵² Moreover, the conversion will also introduce flexibility into the aviation fuel supply chain, allowing, for example, greater use of commercial pipelines and reserve stock trading, where fuel can be acquired by means of a swap with equivalent product in other global locations. The resulting supply chain efficiencies may then be translated into lowered requirements for the petroleum war reserve stocks (PWRS) and corresponding reductions in inventory and infrastructure requirements.
- In conjunction with these changes, the rationalization of DOD's global network of DFSPs (Defense Fuel Support Points) promises to realize additional savings (while maintaining support to warfighters). Since 2007, 38 DFSPs have been closed. Supply chain optimization has resulted in an estimated savings of \$121 million since that time. A similar number are currently under review for potential consolidation or elimination over the next five years, with a goal of reducing a total of three million barrels of storage capacity.⁵³
- Through its Centrally Managed Programs, Recurring Maintenance and Minor Repair, and Planning Studies "pillars," the DLA Energy Sustainment, Restoration, and Modernization (SRM) program is aiming to reduce repair cycle times and reduce the number of "emergent" repair projects not related to regular preventive maintenance and regulatory compliance. Although changes in the SRM program are relatively new and will take time to produce major results, preliminary figures from FY 2014 show progress toward these goals.⁵⁴

Without detracting from the promise of these initiatives, it is also important to note that the achievement of such supply chain efficiencies can involve potential operational

⁵² Terry Shawn and Susan Lowe, "Energy for Less," Loglines, DLA, 2012. The Naval Supply Systems Command Energy Office believes these savings may be overstated because the Business Case Analysis did not consider costs for fuel additives and DFSP infrastructure.

⁵³ "DFSP Functions and Supply Chains," briefing, DLA, February 4, 2014.

⁵⁴ "SRM Overview," briefing, DLA, April 1, 2014.

tradeoffs, which makes close collaboration with Service and combatant command decision-makers a critical aspect of their design and execution. A few examples of potential trade-offs in this area include the following:

- Replacement of MILSPEC aviation fuel with commercial fuel generates new demands on the supply chains for fuel additives (icing inhibitors, static dissipaters, and corrosion inhibitors/lubricity improvers). Ensuring availability and reliability of these additives for both peacetime and contingency operations is an important complementary element of implementing the conversion to commercial fuels.
- Changes in fuel sourcing, inventory levels, or the locations or operational characteristics of fuel infrastructure should be made through a transparent process that allows for due consideration of potential operational risks to contingency plans and other Joint Force missions.
- In pursuing efficiencies through greater centralization of infrastructure maintenance and repair contracting, it is important to retain the participation of sufficient technical and local-level expertise to ensure appropriate and timely validation of requirements.

Finding 7: At GOCO DFSPs, current policy (DoDD 4270.5) does not allow DLA authority to include maintenance and repair responsibilities in contracts for general facilities operations; only Service organizations may contract for maintenance and repair. In some cases, this limitation can impede implementation of the most cost effective approach to maintenance of fuel infrastructure, by requiring additional contracting actions, potentially slowing repair responsiveness, and preventing regional consolidation of contracts across different Service facilities.

Recommendation 7a: OSD should give DLA the authority to contract directly for both maintenance and repair of fuel infrastructure.

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5. Congressional Request

1. Examine the roles and missions currently assigned to DLA

2. Assess DLA's ability to accomplish its roles

The first part of the Congressional request called for an examination of DLA's roles and missions and an assessment of its ability to adequately accomplish them. This paper concludes that DLA's core capabilities—demand planning, inventory management, contracting, and storage and distribution, together with an effective governance structure and IT/ERP system that give executives the information they need to make well-informed decisions—provide DLA with the ability to perform its roles and missions effectively. DLA is organized and has the capabilities needed to meet its customers' requirements.

3. Identify roles and functions that could be transferred from DLA

4. Provide a transition plan for any proposed migration

Another question is whether DLA or the Services are engaged in functions which could be performed more effectively or efficiently by the other. The analysis in this paper provides no candidates for removing any of DLA's roles and missions. Taking the long term perspective, part of the reason for this is that the DOD strategy of consolidation, elimination of redundant fixed costs, DOD-wide enterprise optimization, and taking advantage of DLA's economies of scale has largely been a success. In addition, since the BRAC 2005 decisions, DLA has made substantial gains in its new role of providing retail services.

This paper does not identify any responsibilities that DLA should devolve back to the Services. Interviews and discussions with Service leaders and other Service representatives uncovered no sentiment for undoing previous decisions that had consolidated supply responsibilities into DLA. Rather, the focus of even DLA's strongest critics is on making certain that DLA continues to improve on meeting customer requirements.

5. Identify roles and functions that could be transferred to DLA

The Services have two sets of responsibilities that may be considered for transfer to DLA. The first is the retail supply missions at the Army and Marine Corps industrial depots. These Services, and DOD, would likely gain more efficiencies if their retail supply functions were transitioned to DLA. However, any such transfer should be preceded by joint business case analyses that convincingly demonstrate that the Services (and DOD)

would save money and that DLA would be able to provide equal or better support, measured in terms of readiness and operational effectiveness, to that enjoyed now.

The second potential transfer of responsibilities concerns contracting for the repair of DLRs (the repair of reparable). The value of having a single face to vendors to improve DOD's negotiating position and to achieve available economies of scale is a desired outcome. However, a convincing empirical case should first be made that transferring this responsibility to DLA will result in lower Service budgets and equal or better support; i.e., underlying integrated processes for ensuring readiness and operational effectiveness must not be harmed.

The conduct of business case analyses serves two purposes. If the case for a transfer of responsibilities is strong enough, then those results will come through strongly in the analyses, and will be equally convincing to Service and OSD leaders. In particular, proper attention needs to be given to both effective and efficient outcomes. Effective and efficient results for the operating forces are essential to supporting the Department's warfighting mission, and the business case analyses need to show the pros and cons of alternatives approaches. In addition, any transfer of responsibility, should it be desirable, must include a detailed transition plan to ensure the least amount of disruption to Service logistics operations.

6. Make additional recommendations

Although no fundamental management or organizational changes are needed at DLA, there are still some important areas for improvement. This paper responds to the Congressional request by providing findings and specific recommendations in seven areas—detailed in Chapter 4—on how DLA and Service leaders might further improve DLA's ability to support its customers by improving some internal management practices, both within DLA and within the Services.

DLA's customer focus, and in particular its focus on its retail customers at Service industrial facilities, requires continued attention and improvement. This paper offers several suggestions for how DLA and its Service customers might (1) further improve supply chain integration, (2) use different and improved measures to increase customer responsiveness, and (3) improve demand planning.

While noting that DLA's efforts to improve time to award are already a top priority within DLA, the paper (4) makes several additional suggestions for how DLA and the Services could make even greater gains in this area.

The processes for handling DLRs are complex enough that (5) informed business cases analyses are recommended for sorting out the best path forward.

Interviews and conversations with DLA, Service, and combatant command officials make it clear that many valuable lessons were learned during the decade of conflicts in Afghanistan and Iraq. It is also clear that (6) more effort needs to be placed on incorporating these lessons into future planning, so that they are institutionalized into future practice, rather than being lost.

Finally, DLA's ability to manage the DOD fuel infrastructure would be improved with (7) some relatively minor enhancements to DLA's contracting authorities for maintenance and repair.

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Appendix A

Interviewees

Defense Logistics Agency

VADM Mark Harnitchek	Nikki Cassell	Col Deirdre Mahon
Ted Case	Barry Christensen	Paul Mank
Brad Bunn	Steve Clowser	Steve McCarley
Kathy Cutler	Gerald Collins	Mark Melius
BG Susan Davidson	Col Peter Crean	Timothy Morefield
Phyllisa Goldenberg	Christopher Cullen	Brian Mueller
Twila Gonzales	Jeffrey Curtis	Lisa Oakley
Nancy Heimbaugh	David Dean	Paul Ott
Redding Hobby	John Dreska	CDR Josphe Parran
BG Mark Johnson	Joe Eichorn	Anita Raines
Milt Lewis	Rich Ellis	Francis Rechner
Charles Lilli	Frances Evans	Richard Schwing
Jim McLaugherty	CAPT Rachel Fant	Barbara Simbro
RADM David Pimpo	Kathryn Fantasia	Teresa Smith
Tony Poleo	Joseph Faris	Jennifer Snodgrass
Fred Pribble	Robert Foster	Stephen St. John
Michael Scott	Dana Fuller	CDR Karen Stablefeldt
BG Steven Shapiro	David Graves	Glenn Starks
Brig Gen Giovanni Tuck	Regina Gray	Keith Stedman
Col Rex Adee	COL Victor Hagan	Norman Stiegler
Linda Barnett	CAPT Mark Harris	Jim Tyrrell
Matthew Beebe	Col Dan Hicks	Michael Van House
CDR Tim Benesh	Dan Jennings	Kim Villarreal
COL Richard Bezold	Col Kevin Kachinski	Col Xavier Villarreal
Jeanne Binder	Charles Kaminski	Karon Webb
Marty Binder	Bill Kenny	MAJ Thomas Whitlow
CAPT Ed Bogdanowicz	Steven Kinskie	Eric Wiedermann
Rod Brodeur	David Kless	Patricia Wilkins
Yvette Burke	David Koch	CDR Gwendolyn Willis
Cathy Contreras	Theresa Kyte	Dorothy S. Zachry
Robert Carroll	Jeff Lambert	
Dennis Carr	Joe Long	

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U.S. Central Command, U.S. Pacific Command**

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Gretchen Anderson
Lt Col Bruce Bartholomew
Bill Bennett

Col Todd Cheney
Veronica Daigle
Lisa Davis
Lt Col Jim Malec

Col Mark McCormick
Deline R. (Dee) Reardon
Kwabena Yiadom

Air Force

Lt Gen Andrew Busch
Lt Gen Judith Fedder
Lt Gen Bruce Litchfield
Steve Alsup
Col Luke Closson
Shelbie Duser
Col Hillary Feaster
Steve Gray

Col Dave Haase
Col Roger Johnson
Bonnie Jones
Brig Gen Donald Kirkland
Ross Marshall
Mike McClure
Patricia Miller
Gilbert Montoya

JoAnne Nelson
Shelbie Purser
Rick Reed
Aaron Rex
Col Stan Sheley
Patricia Young
Ann Wemberley
Sandy Windsor

Army

LTG Ray Mason
LTG Patricia McQuisition
MG Lynn Collyar
Lisha Adams
William Andrews
Mr. Alpaugh (FMS)
Willie Benz
Conrad Bonner
Mike Cervone
Susan Cole
Alivia Cowan
Chris Cullen
Jason Detko

Cathy Dickens
Gene Duncan
Greg Etter
COL Fuller (FMS)
Michael Giroux
Sue Goodyear
Col Carmen Goyette
COL Victor Hagan
Mike Hutchison
Drew Jackson
Randle Jackson
COL Dave Luders
Paul A. McMillan

Kathleen Miller
Robert Moore
Renee Mosher
Rick Nesbitt
Col Pate
Anita Raines
J.R. Richardson
LTC Robert Rouse
John Smith
Tim Sullivan
Bobby Turzak
Len Williams

Marine Corps

LTGen William Faulkner
BGen Craig Crenshaw

Michael Madden
Col Stephen Sklenka

Bryan Wood

Navy

Todd Balazs
Bill Frazier
Tracy Moran

William Pierce
Jack Purpich
CAPT Willie Robohn

David Walton

Other

LTG (Ret) (Chris) Christianson
Mae DeVincentis
Lt Gen (Ret) Kathleen Gainey
RADM (Ret) Mark Heinrich

CAPT (Ret) Stuart Jones
Eric Peltz
Marc Robbins

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Appendix B

Congressional Request 0020, National Defense Authorization Act for Fiscal Year 2014, Report of the Committee on Armed Services, U.S. House of Representatives⁵⁵

Defense Logistics Agency Roles and Missions Assessment

The committee is concerned that the 2005 Base Realignment and Closure Commission process may have placed the Defense Logistics Agency (DLA) in roles and assigned missions outside its core competencies which may be resulting in suboptimal support of its customers. In particular, the committee is concerned about the operational and readiness impacts to customers of DLA's continued challenges in effectively managing the supply chain. The committee notes that supply chain management, supply inventories, materiel distribution, and asset visibility, in particular, continue to be "high risk" areas within the Department of Defense, according to the 2013 Government Accountability Office's High Risk Report. While the committee notes the significant progress DLA has made in reducing excess inventory and improving its business processes, the committee has been made aware of persistent challenges in the timely provision of specialized, low-quantity parts and supply chain management, which the committee believes could be a result of a misalignment of roles and missions.

Therefore, the committee directs the Secretary of Defense to conduct an assessment of the roles and missions of DLA. The assessment may, at the election of the Secretary, be conducted by a federally funded research and development center (FFRDC) or an independent, non-governmental institute which is described in section 501(c)(3) of the Internal Revenue Code of 1986 and exempt from tax under section 501(a) of such Code, and has recognized credentials and expertise in national security and military affairs appropriate for the assessment. The assessment should include, but not be limited to, the following:

- An examination of the roles and missions currently assigned to DLA;

⁵⁵ U.S. House of Representatives, *National Defense Authorization Act for Fiscal Year 2014, Report of the Committee on Armed Services, House of Representatives on H.R. 1960* (Report 113-102) (Washington, DC: U.S. Government Printing Office, June 7, 2013), 116–117.

- An assessment of DLA 's ability (resources, structure, workforce, etc.) to adequately accomplish those roles and missions outside of DLA-Energy;
- Identification of any DLA functions, roles, missions, activities, or initiatives that could be more efficiently performed by the military departments or other defense agencies;
- A transition plan for any activities recommended for migration;
- An assessment of functions, roles, missions, activities, or initiatives that could be most efficiently performed by DLA that are currently performed by other military departments or defense agencies; and
- Any other recommendations on ways DLA could further improve its support to customers, management practices, demand forecasting, its use of modeling to determine the optimal number and inventory management.

The committee directs the Secretary of Defense to deliver this assessment in conjunction with the annual budget submission for fiscal year 2015. Further, to enable the committee to provide the necessary oversight, the committee directs the Department to brief the congressional defense committees on the strategy within 30 days of its delivery to Congress.

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Appendix D

References

- Chairman, Joint Chiefs of Staff. *Distribution Operations*. JP 4-09. 19 December 2013. http://www.dtic.mil/doctrine/new_pubs/jp4_09.pdf.
- Defense Logistics Agency, Finance (J8). “Big Ideas.” Briefing. July 29, 2014.
- Defense Logistics Agency. “DFSP Functions and Supply Chains.” Briefing. February 4, 2014.
- Defense Logistics Agency. “Director’s Guidance 2014.”
- Defense Logistics Agency. “SRM Overview.” Briefing. April 1, 2014.
- Department of Defense. “Defense Logistics Agency (DLA).” DOD Directive 5105.224. May 17, 2006. <http://www.dtic.mil/whs/directives/corres/pdf/510522p.pdf>.
- Evans, Kenneth et al. “Improving Aviation Engineering’s Support to the DoD Supply Chain.” Draft briefing (not yet released).
- Evans, Kenneth et al. *Analysis of the Joint Engineering Support System and Its Contribution to the DoD Supply Chain*. IDA P-4202. Alexandria, VA: IDA, May 2007.
- Evans, Kenneth. *Improving the Management of Critical Application Items (CAIs)*. IDA D-4217. Alexandria, VA: IDA, April 2011.
- U.S. House of Representatives. *National Defense Authorization Act for Fiscal Year 2014, Report of the Committee on Armed Services, House of Representatives, on H.R. 1960*. Report 113-102. Washington, DC: U.S. Government Printing Office, June 7, 2013, 116–117.

Background Reading

- Accenture Federal Services. *Sustainment Lifecycle Phase Forecasting and the Impact on Business Outcomes*. July 2013.
- Air Force A4L and Defense Logistics Agency J3. “Overarching Performance Based Agreement (PBA) Metrics, Annex 1.” October 1, 2013.
- Air Force Sustainment Center and Defense Logistics Agency J3. “AFSC and DLA Performance Based Agreement (PBA) Metrics, Annex 6.” January 22, 2014.
- Air Force Sustainment Center. “AFSC Activated at Tinker AFB. OC-ALC Becomes Logistics Complex.” Air Force Materiel Command Public Affairs. July 12, 2012.

Base Realignment and Closure 2005, Storage and Supply. "Supply Process Review Committee (SPRC) Meeting." Briefing. April 9, 2008.

Base Realignment and Closure Commission, Supply and Storage Joint-Cross Service Group. *2005 Base Closure and Realignment Report*. Vol. XI. May 6, 2005.

Base Realignment and Closure Commission. *2005 Defense Base Closure and Realignment Commission Report*. Vols. 1 and 2. September 8, 2005.

Boyce, John and Allan Banghart. "Performance Based Logistics and Project Proof Point: A Study of PBL Effectiveness." *Defense AT&L: Product Support Issue* (March–April 2012): 26–30.

Burke, Yvette. "Time to Award Update to Vice Admiral Harnitchek." Briefing. 28 January 2014.

Business Executives for National Security. "Finding Efficiencies in the Business of Defense: Reducing Fuel Cost for the Defense Logistics Agency." February 2013.

Defense Logistics Agency Energy. *Fact Book Fiscal Year 2012*.

Defense Logistics Agency, Land and Maritime Supply Chains. "BRAC 2005 Storage and Supply Decisions." Briefing. August 2009.

Defense Logistics Agency. "Agency Performance Review." Briefing. 30 October 2013.

Defense Logistics Agency. "Director's Guidance 2013."

Defense Logistics Agency. "Enterprise Performance Based Logistics Value Proposition." Briefing. June 17, 2013.

Director of Logistics, United States Air Force (AF/A4L) and Director, Logistics Operations, Defense Logistics Agency (DLA J3). "Performance Based Agreement." Version 4, September 20, 2013.

Dowd, Kenneth S., MG (USA). "Directive-Type Memorandum (DTM) 13-007 – DLA First Article Requirements and Process Management." Memorandum. DLA Logistics Operations (J3). February 4, 2013.

Government Accountability Office. "Defense Logistics: DOD Has Taken Actions to Improve Some Segments of the Materiel Distribution System: Letter to Senator Carl Levin, et al." February 2013.

Government Accountability Office. *Defense Inventory: Actions Needed to Improve the Defense Logistics Agency's Inventory Management*. GAO-14-495. June 2014.

Government Accountability Office. *Defense Inventory: Actions Underway to Implement Improvement Plan, but Steps Needed to Enhance Efforts*. GAO-12-493. May 2012.

Government Accountability Office. *Defense Inventory: Defense Logistics Agency Needs to Expand on Efforts to More Effectively Manage Spare Parts*. GAO-10-469. May 2010.

Government Accountability Office. *Defense Logistics: A Completed Comprehensive Strategy is Needed to Guide DOD's In-Transit Visibility Efforts*. GAO-13-201. August 3, 2012.

Government Accountability Office. *Defense Logistics: DOD Needs to Take Additional Actions to Address Challenges in Supply Chain Management*. GAO-11-569. July 2011.

Government Accountability Office. *Defense Logistics: Improvements Needed to Enhance DOS's Management Approach and Implementation of Item Unique Identification Technology*. GAO-12-482. May 2012.

Government Accountability Office. *High-Risk Series: An Update*. GAO-13-283. February 2013.

Government Accountability Office. *Military Base Realignments and Closures: Higher Costs and Lower Savings Projected for Implementing Two Key Supply-Related BRAC Recommendations*. GAO-08-315. March 2008.

Government Accountability Office. *Warfighter Support: DOD Has Made Progress, but Supply and Distribution Challenges Remain in Afghanistan*. GAO-12-138. October 2011.

Government Accountability Office. *Warfighter Support: Improved Joint Oversight and Reporting on DODs Prepositioning Programs May Increase Efficiencies*. GAO-11-647. May 2011.

Gray, Steve, and Colonel Zebby Miles. "AFSC WW SCM DLA Performance." Briefing. Air Force Sustainment Center. February 6, 2014.

Gray, Steve. "DLA ICP Performance to WR-ALC EMXG." Briefing. Air Force Sustainment Center. March 17, 2014.

Headquarters, Department of the Army. *Sustainment*. Field Manual 4.0. Washington, DC: HQDA, 30 April 2009.

Inspector General, Department of Defense. *Use of Defense Logistics Agency Excess Parts for High Mobility Multipurpose Wheeled Vehicle Depot Repairs Will Reduce Costs*. April 25, 2013.

Leinneweber, Tom. "F108 Engine Line Lean Project." Briefing. Oklahoma City Air Logistics Center. February 4, 2014.

Lepore, Brian J. *Military Base Realignments and Closures*. GAO-12-709R. U.S. Government Accountability Office, June 29, 2012.

Lepore, Brian J. *Military Base Realignments and Closures: Key Factors Contributing to BRAC 2005 Results*. GAO-12-513T. U.S. Government Accountability Office, March 8, 2012.

Logistics Management Institute. "DLA Disposition Useable Item Sales: Independent Review of Approach." Briefing. November 21, 2013.

- Luders, David J., COL (USA). "Rock Island Arsenal, Joint Manufacturing and Technology Center, Critical Capabilities." Briefing. February 24, 2014.
- McCormick, Mark A., COL (USA). *An Integrated Supply Chain Solution for Theater Distribution*. U.S. Army War College, March 30, 2009.
- Office of the Deputy Assistant Secretary of Defense for Materiel Readiness. *Proof Point Project: A Study to Determine the Impact of Performance Based Logistics (PBL) on Life Cycle Costs*. November 30, 2011.
- Parlier, Greg H. "Transforming U.S. Army Supply Chains: Strategies for Management Innovation," *Supply and Operations Management Collection*, Steven Nahmias, ed. Business Expert Press, February 2011.
- Peltz, Eric, Amy Cox, and Edward Chan. "Improving DLA Supply Chain Agility: Preliminary Recommendations." Briefing. RAND, October 2013.
- Peltz, Eric, Marc Robbins, and Geoffrey McGovern. *Integrating the Department of Defense Supply Chain*. RAND Corporation, 2012.
- Purser, Shelbie. "WR-ALC Aircraft Supportability." Briefing. Warner Robins Air Logistics Complex. June 2013.
- Rash-Gehres, Mindy, et al. "A Cost-Efficient Approach to Inventory Management." Defense AT&L. (January–February 2013): 44–49.
- Robbins, Marc, Patricia Boren, and Kristen Leuschner. "The Strategic Distribution System in Support of Operation Enduring Freedom." Documented Briefing. RAND Corporation, March 2004.
- Spicer, John. "Performance Based Logistics, The DLA Approach." Briefing. Defense Logistics Agency, September 26, 2013.

Appendix E

Abbreviations

AFMC	Air Force Materiel Command
AFSC	Air Force Sustainment Center
ALC	Air Logistics Complex
ASD	Assistant Secretary of Defense
AT&L	Acquisition, Technology and Logistics
B	billion
BO	backorder
BOM	bill of material
BRAC	Base Realignment and Closure
CAI	Critical Application Item
CIMIP	Comprehensive Inventory Management Improvement Plan
COCO	contractor owned, contractor operated
CONUS	continental United States
DFSP	Defense Fuel Support Point
DLA	Defense Logistics Agency
DLR	depot level repairable
DOD	Department of Defense
DODD	Department of Defense Directive
DVD	Direct Vendor Delivery
DWCF	Defense-Wide Working Capital Fund
EBS	Enterprise Business System
ERP	Enterprise Resource Planning
ESA	Engineering Support Activity
FFRDC	federally funded research and development center
FMS	foreign military sales
FRC	Fleet Readiness Center
FTE	Full Time Equivalent
FY	Fiscal Year
GAO	Government Accountability Office

GOCO	government owned, contractor operated
GOGO	government owned, government operated
HQs	headquarters
IDA	Institute for Defense Analyses
IT	information technology
K	thousand
L&MR	Logistics and Materiel Readiness
M	million
MA	material availability
NATO	North Atlantic Treaty Organization
NSN	national stock number
OCONUS	outside [the] continental United States
OEM	original equipment manufacturer
ORT	order response time
OSD	Office of the Secretary of Defense
PBA	Performance Based Agreement
PDM	Programmed Depot Maintenance
PWRS	Petroleum War Reserve Stocks
SDDC	Surface Deployment and Distribution Command
SRM	sustainment, restoration, and modernization
U.S.	United States
USD	Under Secretary of Defense
USTRANSCOM	U.S. Transportation Command
WIP	work in progress

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14. ABSTRACT This review of the roles and missions of the Defense Logistics Agency (DLA) was prompted by congressional concerns over DLA's responsibilities when compared with those of its Military Service customers. The review finds that DLA is successfully demonstrating the benefits of DOD's policy of consolidating certain functions. DLA is well organized and well managed, and it is successfully helping DOD take advantage of the Department's economies of scale in supply and distribution. In particular, DLA has the core competencies required to manage its business effectively and efficiently: demand planning, inventory management, contracting, and storage and distribution. New responsibilities in retail support to Service industrial activities (depots and shipyards) have proved challenging, but concerted management attention in recent years has resulted in significant improvements. This review provides recommendations for further strengthening DLA's customer focus, and, in particular, its ability to meet the needs of its industrial retail customers.					
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